

# ELENCO RICAMBI ATTREZZATURE JET GROUTING

## JET GROUTING EQUIPMENT SPARE PARTS







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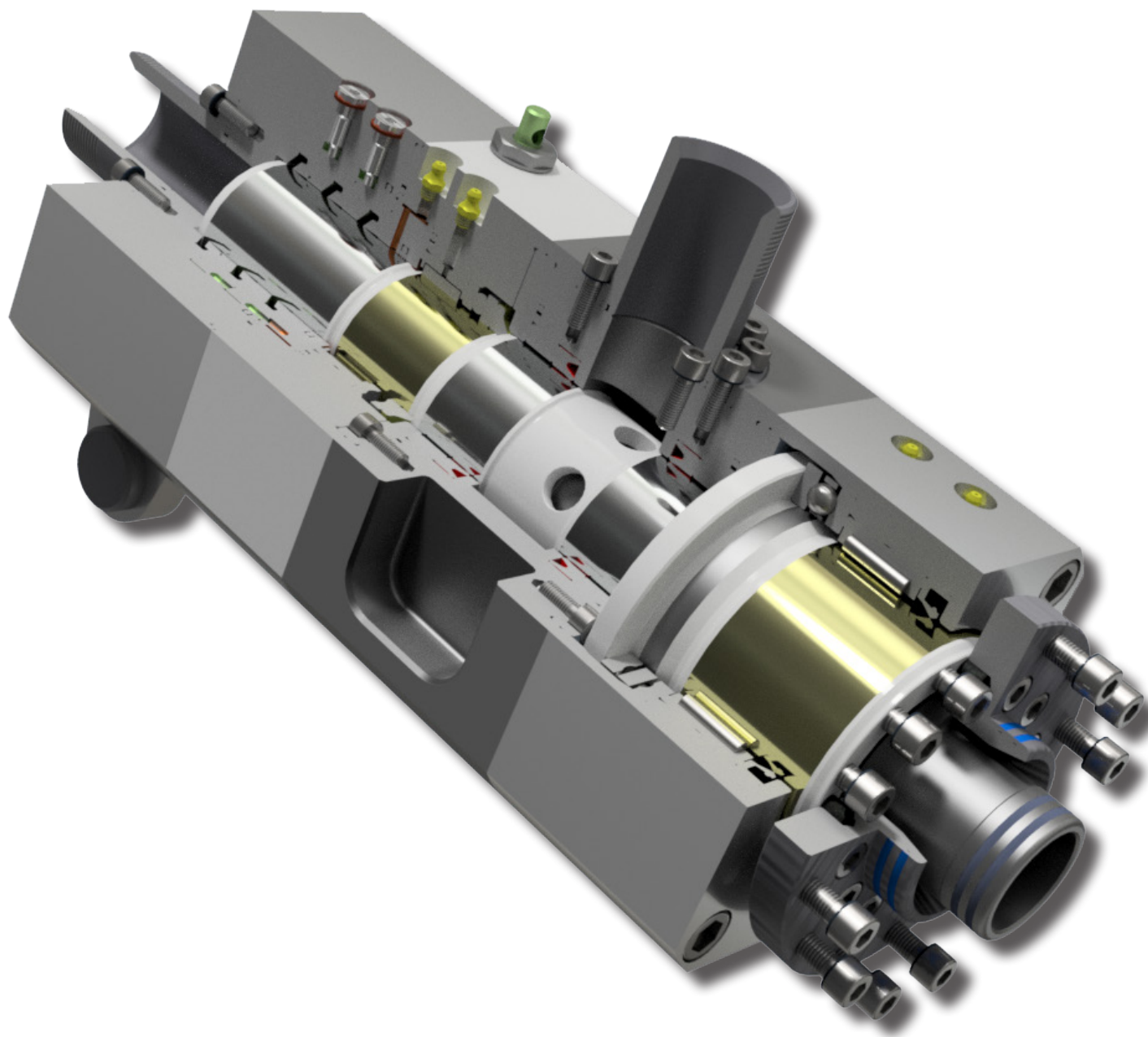


**1 REVISIONI DOCUMENTO - DOCUMENT REVISIONS**

| REV. No. | DATE       | DESCRIPTION                                                                                                                                                                                                                                                            |
|----------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | 22-06-2004 | Revisione generale.                                                                                                                                                                                                                                                    |
| 2        | 19-03-2005 | Aggiunto § 9.2.                                                                                                                                                                                                                                                        |
| 3        | 28-06-2007 | Variato § 1.1 e § 7.3 per nuove guarnizioni.                                                                                                                                                                                                                           |
| 4        | 02-12-2007 | Variato § 3 per aggiunta Modular swivel. Aggiunto § 11 Strajet e § 12 C2H D.114.                                                                                                                                                                                       |
| 5        | 12-05-2008 | Variato § 6.1 e 6.2 per sostituzione testa K3 D.90 con K3 D.114 vers. 90. Variato § 7.2 per aggiunta porta guarnizione pos. 44. Variati § 8-9.1-10 per aggiunta codici aste heavy-duty. Aggiunti § 10.1 per Wassara una via e § 10.3 per esploso monitor DTH Wassara.  |
| 6        | 25-09-2008 | Variati titoli tipologie di perforazione per corrispondenza con definizioni commerciali. Variato monitor K3 d.114.                                                                                                                                                     |
| 7        | 05-02-2009 | Pag. 14/108: rif. Item 13, codice MR-B181141 sostituito da 889K3011. Pag. 23/108: rif. Item 4, 8C2TS656(**) sostituito da 8C2TS656(*). Pag. 26/108: rif. Item 2, D-699-3-4-1 sostituito da 8C214553. Pag. 73/108: rif. Item 4, 8C2T706(**) sostituito da 8C2TS706 (*). |
| 8        | 05-07-2013 | Revisione generale                                                                                                                                                                                                                                                     |
| 9        | 20-01-2015 | Revisione impaginazione per raccoglitore ad anelli. Modificato §3.9: asta D.114 K3 (era con nipplo).                                                                                                                                                                   |
| 10       | 15-03-2016 | Aggiunti swivels D.114 T3 e D2; aste D.114 T3 C3 D2; monitor D.114 T3/ C3. Aggiunti pesi componenti. Aggiornati codici minuteria.                                                                                                                                      |
| 11       | 12-02-2018 | Modificati codici swivel HP Modular, D2, T3. Aggiunto ugello Strajet IV.                                                                                                                                                                                               |
| 12       | 24-09-2018 | Revisione § 2. aggiunto § 6. Modificati monitor J-8C214483 e J-1C214483. Aggiunto J-1C214483-P.                                                                                                                                                                        |
| 13       | 21-06-2022 | Revisione generale                                                                                                                                                                                                                                                     |
| 14       | 01-02-2023 | Sezione 4: aggiunti §4.20 e 4.21 per monitor C2H HEX80                                                                                                                                                                                                                 |
| 15       | 03-05-2023 | Sezione 4: aggiunti §4.22 e 4.23                                                                                                                                                                                                                                       |
| 16       | 02-02-2024 | Sezione 4: modificati §4.2 e §4.5 per aggiornamento adattatori monitor a nuova versione senza vite.                                                                                                                                                                    |



## 2 TESTE ALTA PRESSIONE - HIGH PRESSURE SWIVELS





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2.1 D.76 H.P. JET SWIVEL (140 L/MIN.-500 BAR): J-J00TAL76

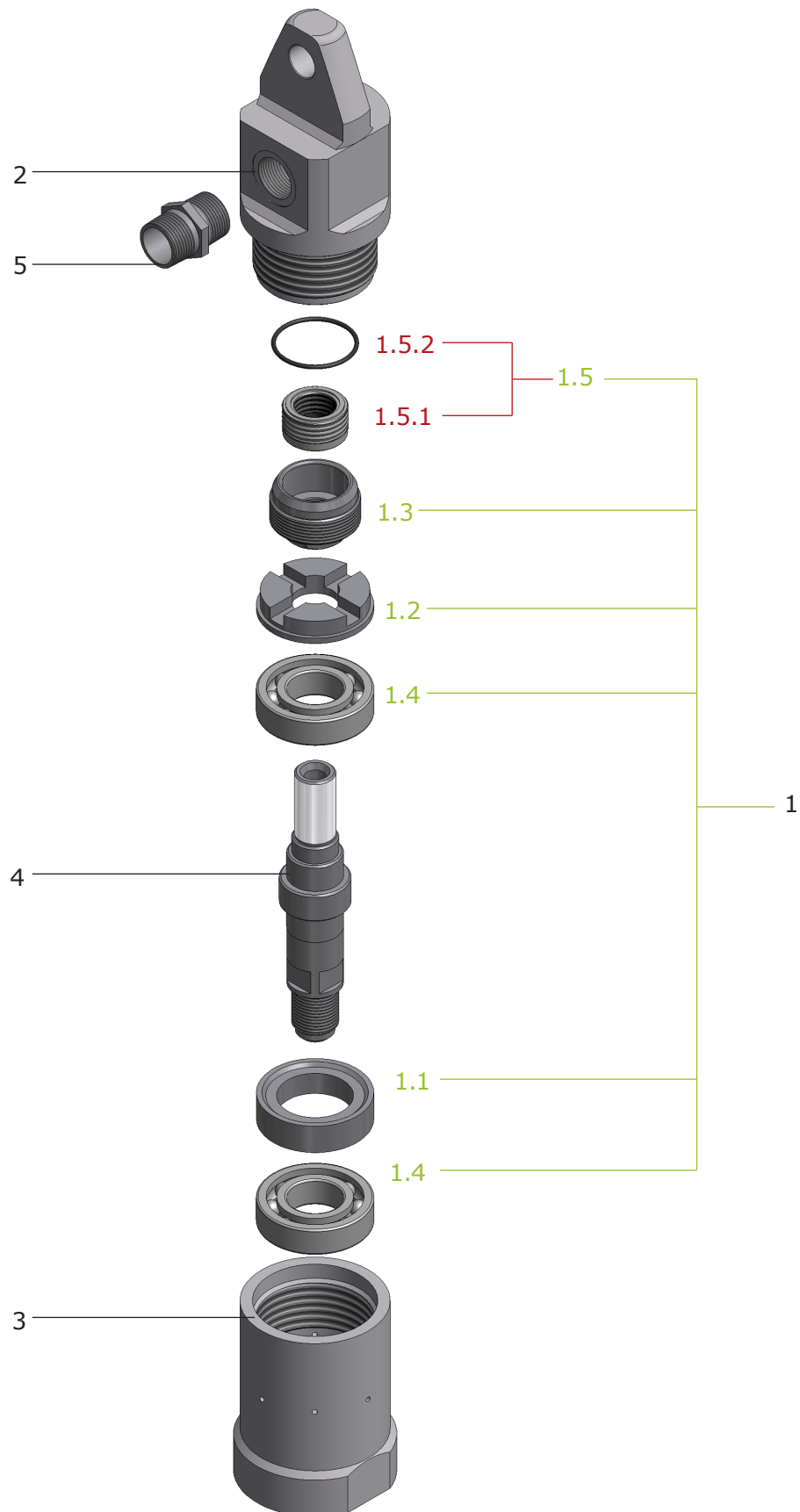
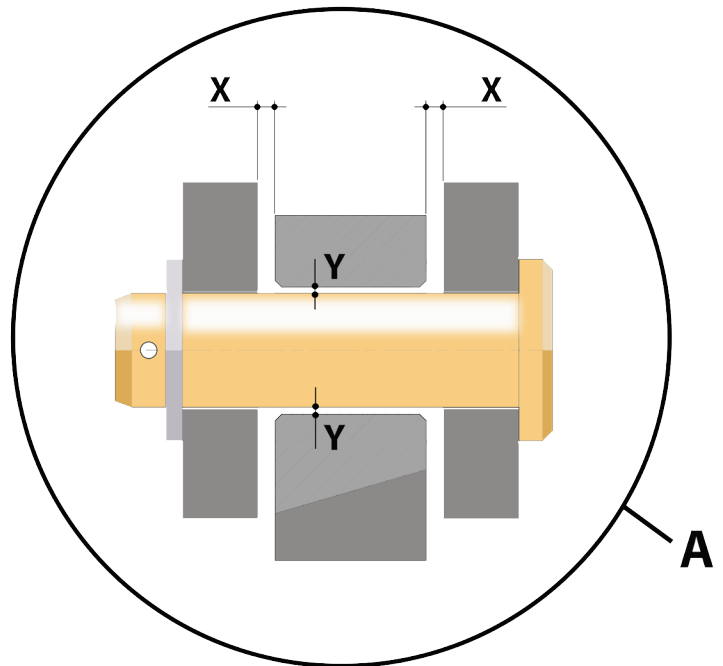
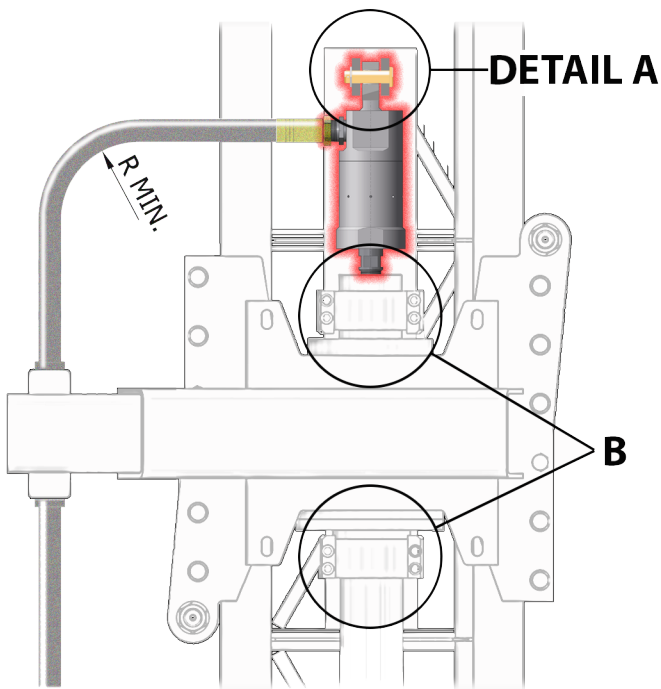


FIG. 2.1

J-J00TAL76 (REF. FIG. 2.1)

| REF. No. | CODICE CODE     | DESCRIZIONE                             | DESCRIPTION                   | QTY | NOTE |
|----------|-----------------|-----------------------------------------|-------------------------------|-----|------|
| 1        | J-J01TAL76      | KIT RICAMBI TESTA A.P.                  | SWIVEL SPARE PARTS KIT        | 1   |      |
| 1.1      | J-J06TAL76      | DISTANZIALE TESTA J00TAL76 (CUSCINETTI) | SWIVEL ROLLER BEARINGS SPACER | 1   | (1)  |
| 1.2      | J-J07TAL76      | DISTANZIALE TESTA A.P. J00TAL76         | SWIVEL SPACER                 | 1   | (1)  |
| 1.3      | J-J08TAL76      | DISTANZ. TESTA J00TAL76 (PORTA GUARN.)  | SWIVEL SEALS HOUSING          | 1   | (1)  |
| 1.4      | MR-62062RS      | CUSCINETTO 6206 2RS                     | 6206 2RS ROLLER BEARING       | 2   | (1)  |
| 1.5      | J-J02TAL76      | KIT GUARNIZ. TESTA A.P.                 | SWIVEL SEALS KIT              | 1   |      |
| 1.5.1    | MR-SM137086-1AX | SM 137086-1AX RIF. POLYPAC              | MAIN SEAL SM 137086-1AX REF.  | 1   | (1)  |
| 1.5.2    | MR-OR223        | GUARNIZIONE O-RING                      | O-RING SEAL                   | 1   | (1)  |
| 2        | J-J03TAL76      | CORPO SUP. MASCHIO TESTA J00TAL76       | UPPER SWIVEL HEAD MALE        | 1   |      |
| 3        | J-J04TAL76      | CORPO INF. FEMMINA TESTA J00TAL76       | LOWER SWIVEL HEAD FEMALE      | 1   |      |
| 4        | J-J05TAL76      | ALBERO TESTA A.P.                       | SWIVEL SHAFT                  | 1   |      |
| 5        | J-J32NC034      | NIPPLO 3/4"                             | 3/4" NIPPLE                   | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

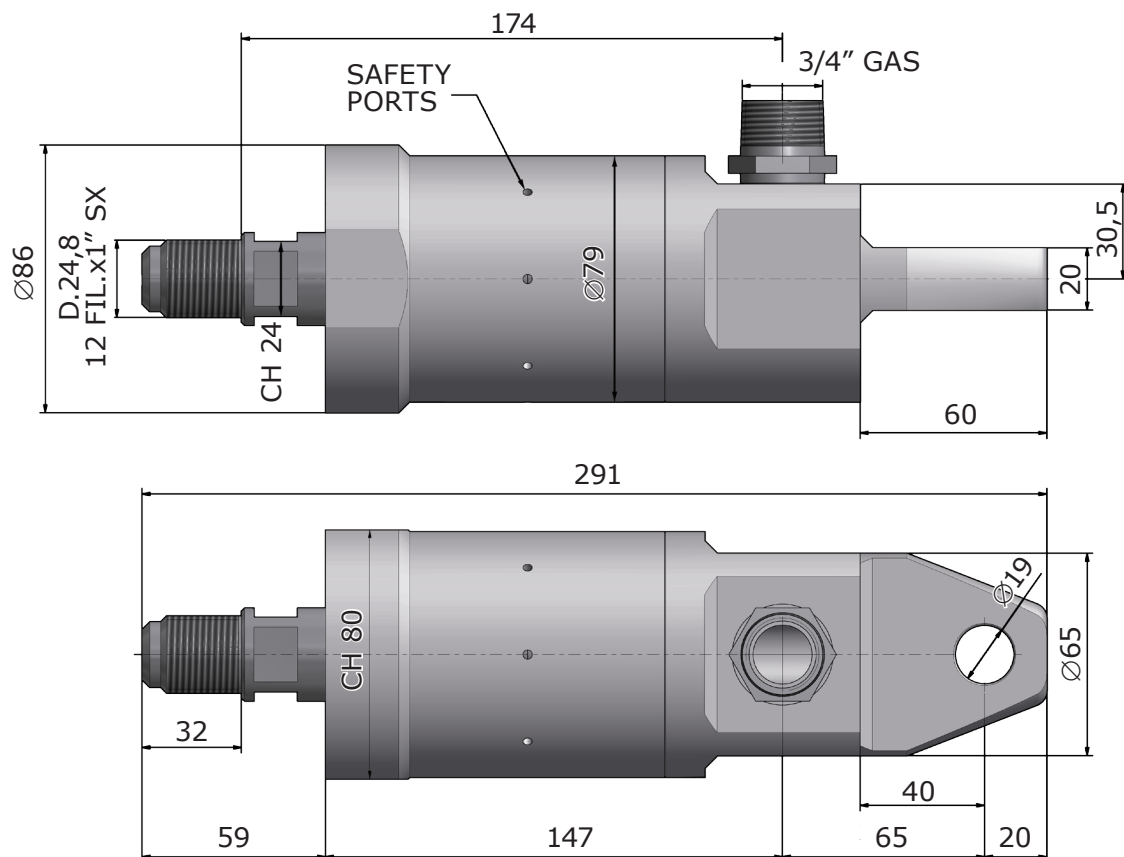
Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-J00TAL76                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 40 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 110-130 RPM                                                                                                 |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 2 KN                                                                                                        |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 3 KG                                                                                                        |



## 2.2 D.90 H.P. JET SWIVEL (410 L/MIN.-560 BAR): J-8C2TS650

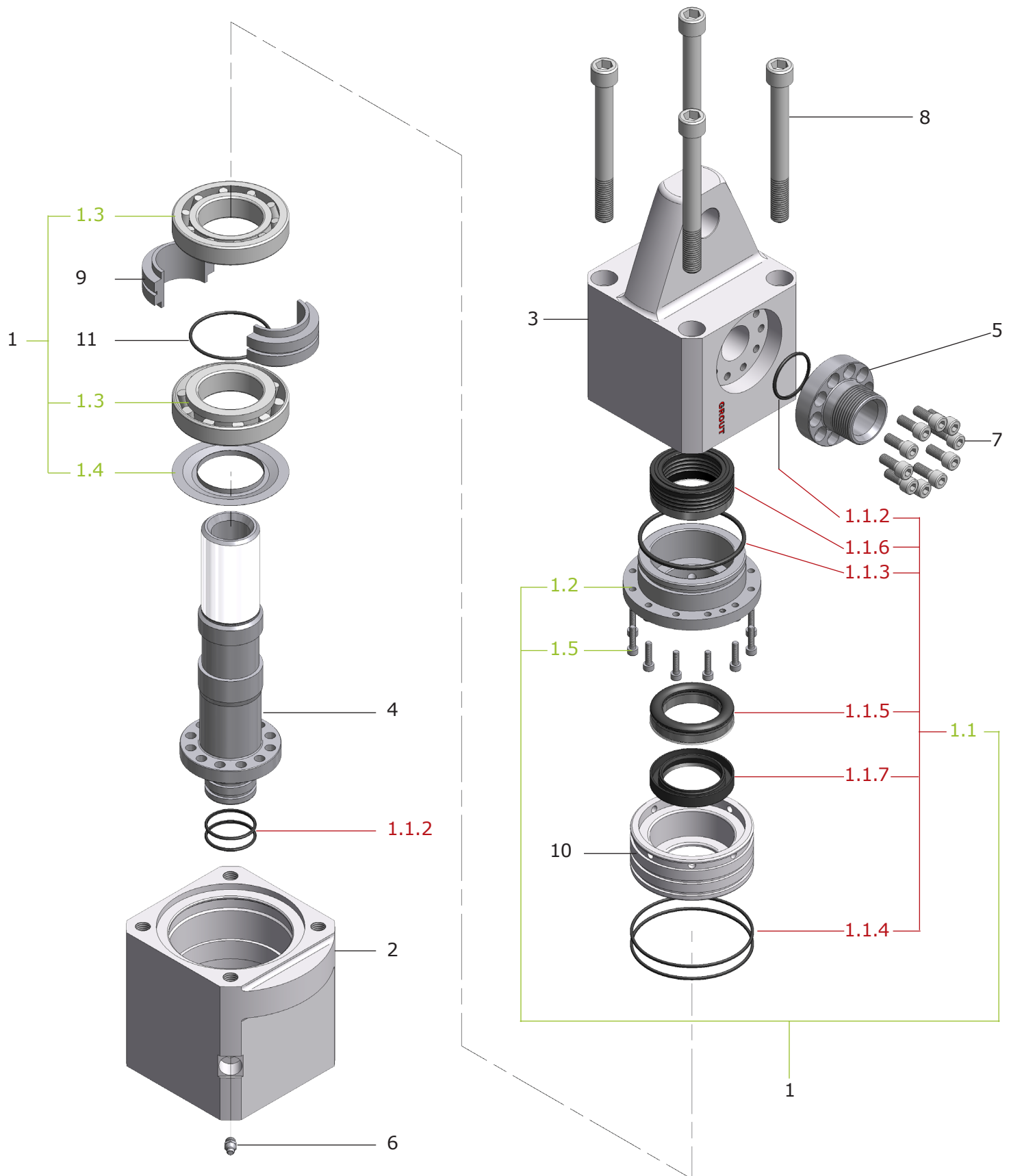


FIG. 2.2



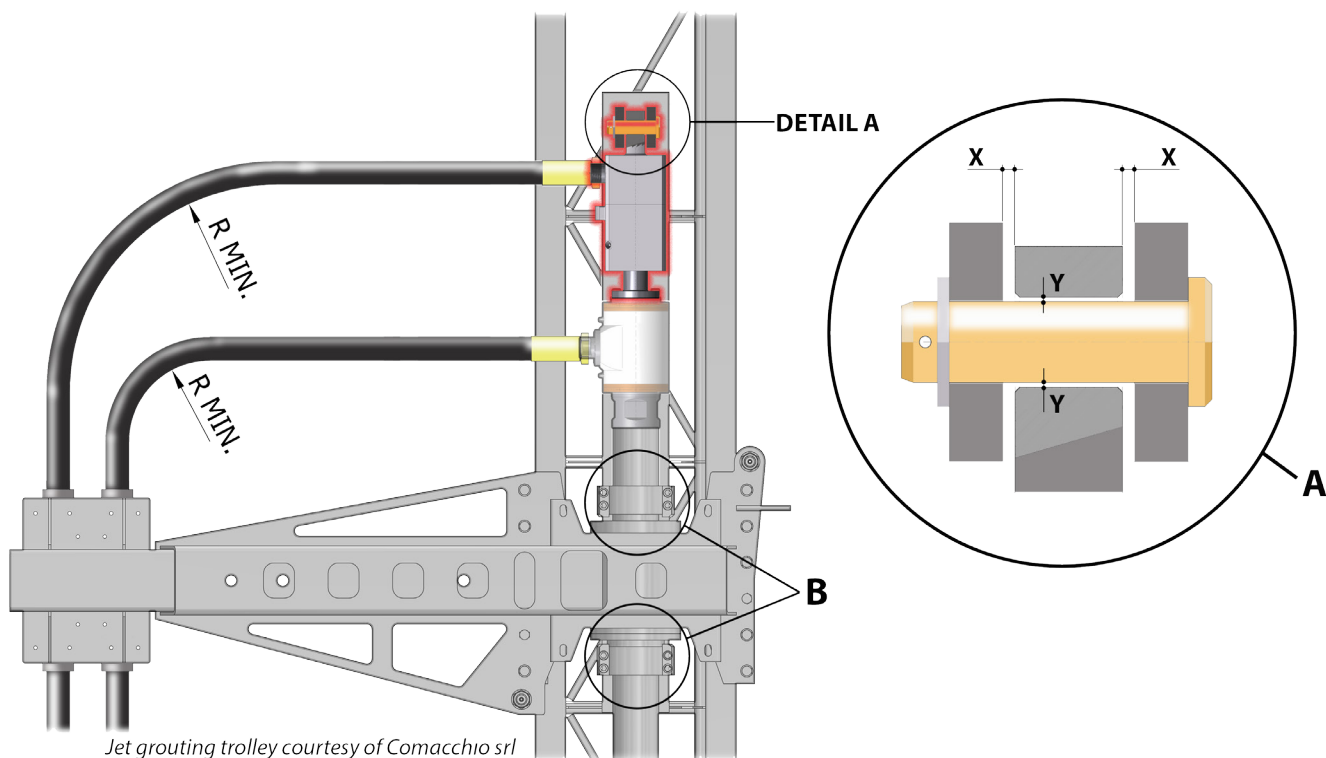
J-8C2TS650 (REF. FIG. 2.2)

| REF. No. | CODICE CODE        | DESCRIZIONE                        | DESCRIPTION                  | QTY | NOTE      |
|----------|--------------------|------------------------------------|------------------------------|-----|-----------|
| 1        | J-8C2TS651         | KIT RICAMBI TESTA A.P.             | H.P. SWIVEL SPARE PARTS KIT  | 1   |           |
| 1.1      | J-8C2TS652         | KIT GUARNIZ. TESTA A.P.            | H.P. SWIVEL SEALS KIT        | 1   |           |
| 1.1.2    | MR-OR126           | O-RING 126 RIF POLYPAC             | O-RING SEAL 126 RIF POLYPAC  | 3   | (1)       |
| 1.1.3    | MR-OR234           | O-RING RIF.POLIPAC 234             | O-RING SEAL RIF.POLIPAC 234  | 1   | (1)(2)    |
| 1.1.4    | MR-OR153           | O-RING RIF.POLIPAC 153             | O-RING SEAL RIF.POLIPAC 153  | 2   | (1)       |
| 1.1.5    | MR-DS255177        | GUARN. DS255177 RIF POLYPAC        | DS255177 REF POLYPAC SEAL    | 1   | (1)(2)    |
| 1.1.6    | MR-SM255177/1AX    | GUARN. 255177/1AX POLYPAC          | 255177/1AX POLYPAC SEAL      | 1   | (1)(2)(3) |
| 1.1.7    | MR-AS45X65X10      | PARAOLIO AS 45X65X10 ISO6194       | AS 45X65X10 ISO6194 LIP SEAL | 1   | (1)(2)    |
| 1.2      | J-8C2TS656         | GUIDA PORTA GUARNIZIONI TESTA A.P. | H.P. SWIVEL SEALS HOUSING    | 1   | (1)       |
| 1.3      | MR-30210           | CUSCINETTO 3DB 50X90X21.75         | 3DB 50X90X21.75 BEARING      | 2   | (1)       |
| 1.4      | MR-30210JV         | ANELLO NILOS JV 30210              | NILOS RING JV 30210          | 1   | (1)       |
| 1.6      | 5931M5X20P08129GR  | VITE TCEI M5X20 12.9 UNI5931       | SOCKET SCREW M5X20 12.9      | 12  | (1)       |
| 2        | J-8C2TS653         | CORPO EST. INF. TESTA A.P.         | SWIVEL LOWER BODY            | 1   |           |
| 3        | J-8C2TS654         | CORPO SUP TESTA A.P.               | SWIVEL UPPER BODY            | 1   |           |
| 4        | J-8C2TS655         | ALBERO TESTA A.P.                  | SWIVEL SHAFT                 | 1   |           |
| 5        | J-8C2TS659         | ATTACCO 1"1/4                      | 1"1/4 INLET                  | 1   |           |
| 6        | 71412AM8P125       | INGRASSATORE M8                    | M8 LUBRICATOR                | 1   |           |
| 7        | 5931M8X20P125129GR | VITE TCEI M8X20 12.9 UNI 5931      | SOCKET SCREW M8X20 12.9      | 10  |           |
| 8        | 5931M14X130P2129GR | VITE TCEI M14X130 12.9 UNI 5931    | SOCKET SCREW M14X130 12.9    | 4   |           |
| 9        | J-8C2TS657         | MEZZALUNA ALBERO TESTA A.P.        | SHAFT HALF RING              | 1   | (1)       |
| 10       | J-8C2TS658         | DISTANZIALE PORTA GUARNIZIONI      | SEALS HOUSING SPACER         | 1   | (1)       |
| 11       | MR-OR136           | O-RING 136 RIF POLYPAC             | O-RING SEAL RIF POLYPAC 136  | 1   | (1)       |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

(2) KIT GUARNIZIONI CENTRALI TESTA: J-8C2TS652-A - SWIVEL MIDDLE SEALS KIT: J-8C2TS652-A

(3) SOSTITUITO DA MR-CH255177 PER COD. J-8C2TS652-H GUARN. CENTRALI ALTA VELOCITA' - REPLACED BY MR-CH255177 FOR HIGH SPEED MIDDLE SEALS, CODE J-8C2TS652-H



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

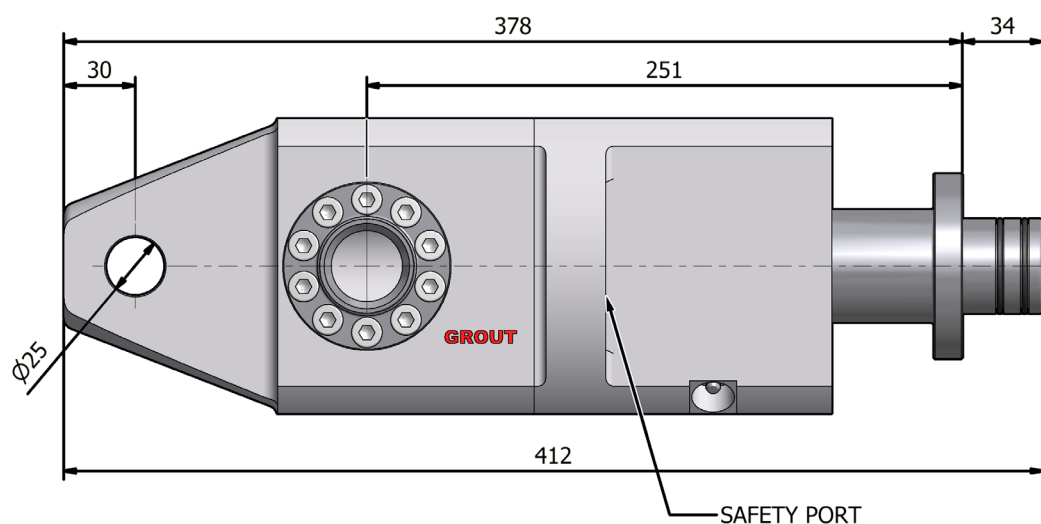
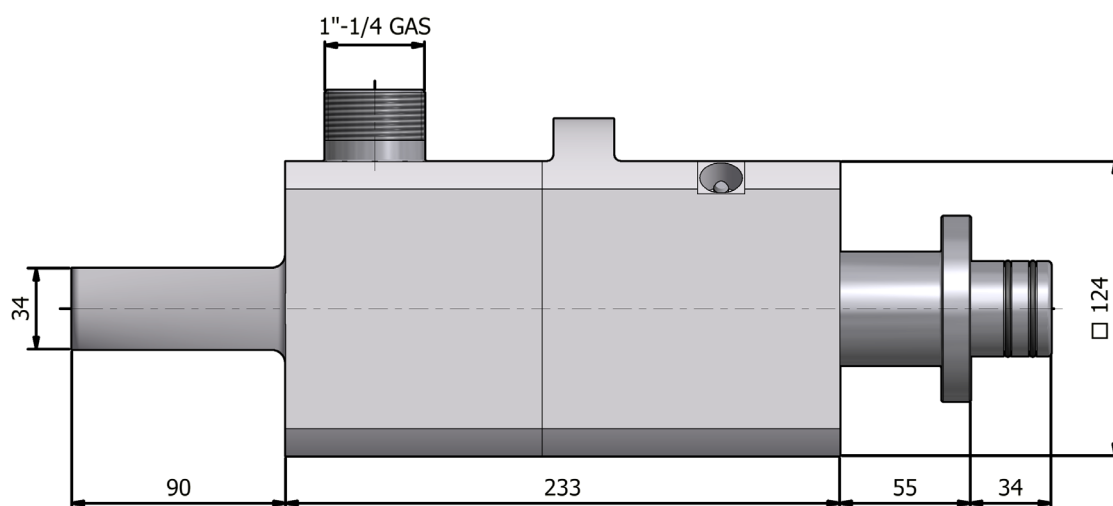
Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8C2TS650                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 35 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 90-120 RPM                                                                                                  |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 7 KN                                                                                                        |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 11 KG                                                                                                       |



2.3 UNDER ROTARY SWIVEL 2"-3/8 A.R. (210 L/MIN.-500 BAR): J-SW90238R

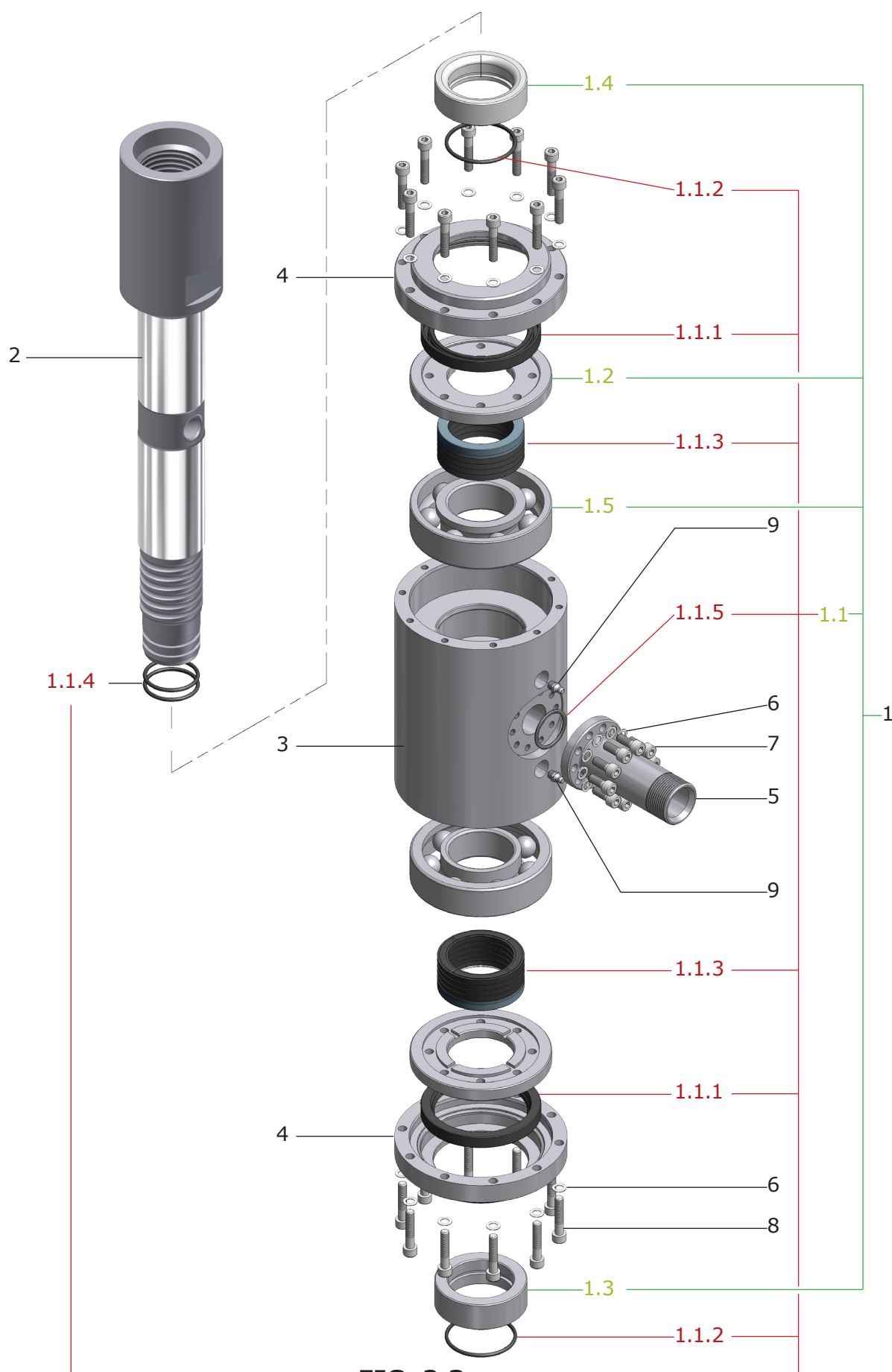


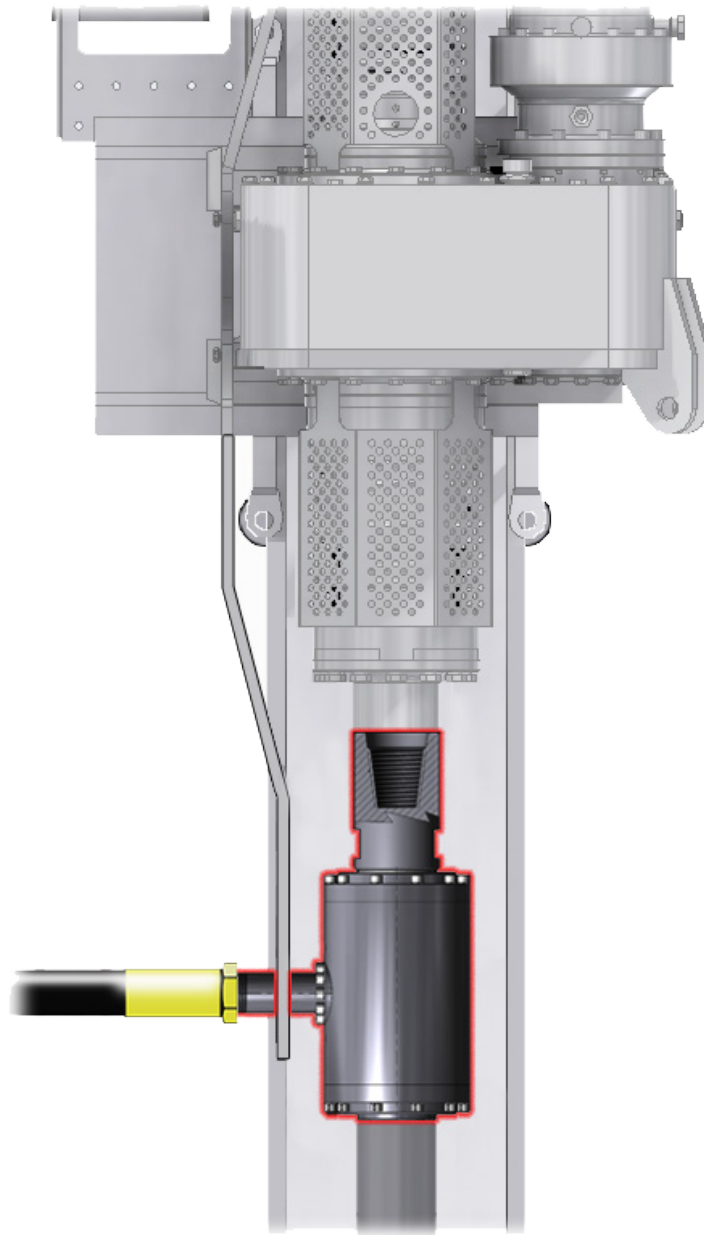
FIG. 2.3



## J-SW90238R (REF. FIG. 2.3)

| REF. No. | CODICE CODE        | DESCRIZIONE                         | DESCRIPTION                   | QTY | NOTE |
|----------|--------------------|-------------------------------------|-------------------------------|-----|------|
| 1        | J-SW90278R-S       | KIT RICAMBI SWIVEL J-SW90           | J-SW90 SW. SPARE PARTS KIT    | 1   |      |
| 1.1      | J-SW90278R-K       | KIT GUARN. SWIVEL J-SW90            | J-SW90 SWIVEL SEALS KIT       | 1   |      |
| 1.1.1    | MR-A85X110X12      | PARAOLIO 85X110X12 SING. LAB.       | 85X110X12 ONE LIP SEAL        | 2   | (1)  |
| 1.1.2    | MR-OR229           | OR-229 RIF POLYPAC                  | O-RING 229 SEAL REF POLYPAC   | 2   | (1)  |
| 1.1.3    | MR-SM314236-1AX    | GUARN. SM314236-1AX                 | SM314236-1AX SEAL             | 2   | (1)  |
| 1.1.4    | MR-OR224           | O-RING 224 RIF. POLIPAC             | O-RING 224 SEAL REF. POLIPAC  | 2   | (1)  |
| 1.1.5    | MR-OR126           | O-RING 126 RIF. POLIPAC             | O-RING 126 SEAL REF. POLIPAC  |     | (1)  |
| 1.2      | D-1351-4           | PREMIGUARNIZIONE SWIVEL J-SW90      | J-SW90 SWIVEL SEAL RETAINER   | 2   | (1)  |
| 1.3      | D-1351-5           | DISTANZIALE SWIVEL J-SW90           | J-SW90 SWIVEL SPACER          | 1   | (1)  |
| 1.4      | D-1351-7           | DISTANZ. EST. SWIVEL J-SW90         | J-SW90 SWIVEL EXTERNAL SPACER | 1   | (1)  |
| 1.5      | MR-7312BE          | CUSCINETTO OBL. 7312 BE             | 7312 BE ROLLER BEARING        | 2   | (1)  |
| 2        | D-1351-6-238       | ALBERO SWIVEL SOTTO TESTA 2"-3/8 AR | SWIVEL SHAFT 2"-3/8 AR        | 1   |      |
| 3        | D-1351-1           | CORPO ESTERNO SWIVEL J-SW90         | J-SW90 SWIVEL BODY            | 1   |      |
| 4        | D-1351-3           | FLANGIA PARAOLIO SWIVEL J-SW90      | J-SW90 SW. LIP SEAL FLANGE    | 2   |      |
| 5        | D-0699-3-4-2       | ATTACCO 1"-1/4                      | 1"-1/4 INLET                  | 1   |      |
| 6        | SCHNORM8ZB         | RONDELLA SCHNORR M8                 | SCHNORR M8 WASHER             | 30  |      |
| 7        | 5931M8X20P125129GR | VITE TCEI M8X20 12.9 UNI 5931       | SOCKET SCREW M8X20 12.9       | 10  |      |
| 8        | 5931M8X40P125129GR | VITE TCEI M8X40 12.9 UNI 5931       | SOCKET SCREW M8X40 12.9       | 20  |      |
| 9        | 71412AM8P125       | INGRASSATORE M8                     | M8 LUBRICATOR                 | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio.

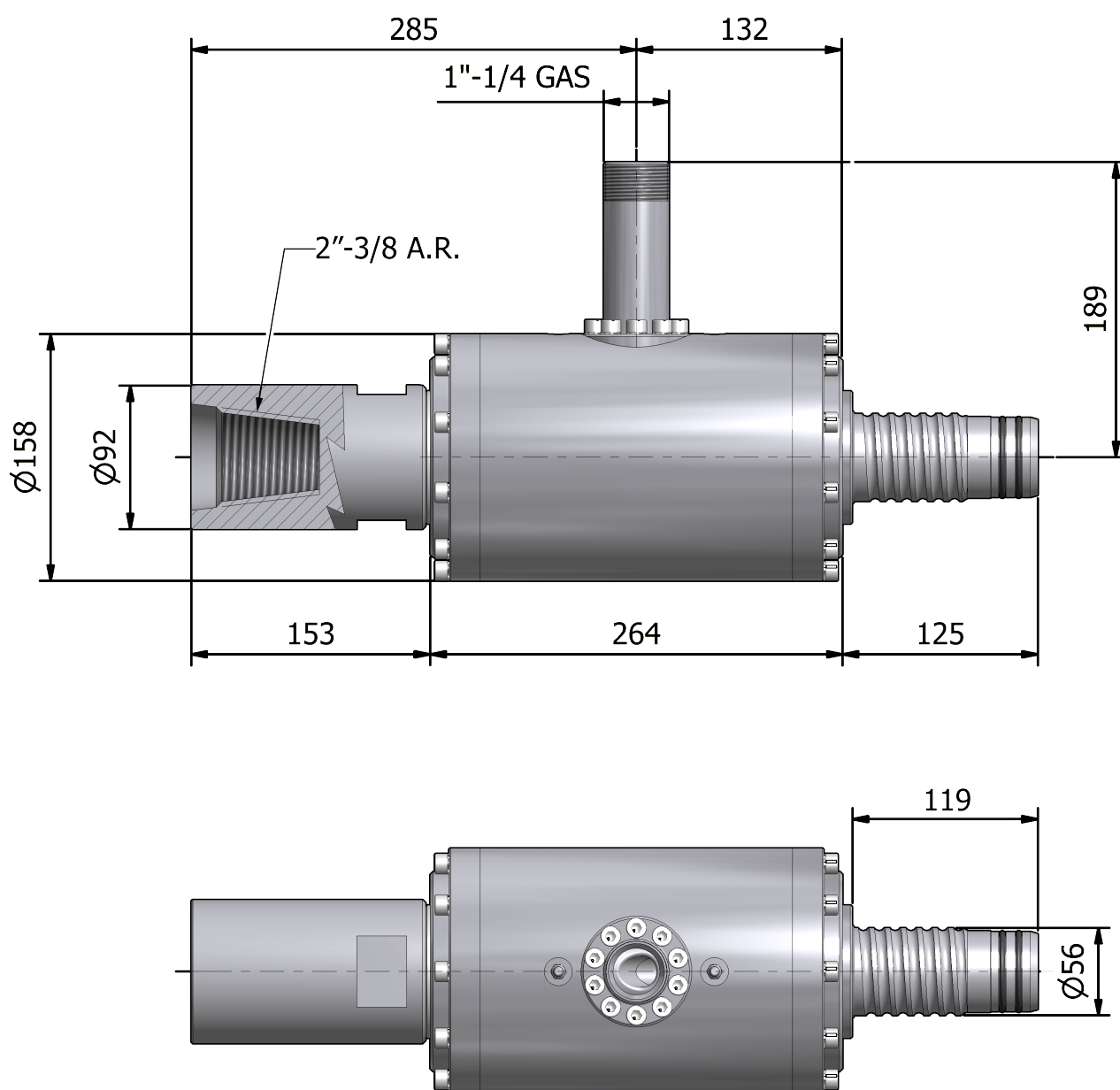
***Washing procedure after jet grouting treatment:***

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

***Maintenance:***

*Lubricate the roller bearings at least every 3h using lithium based grease.*

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-SW90238R                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 80-100 RPM                                                                                                  |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 15 kNm                                                                                                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 42 KG                                                                                                       |



2.4 UNDER ROTARY SWIVEL 2"-7/8 A.R. (210 L/MIN.-500 BAR): J-SW90278R

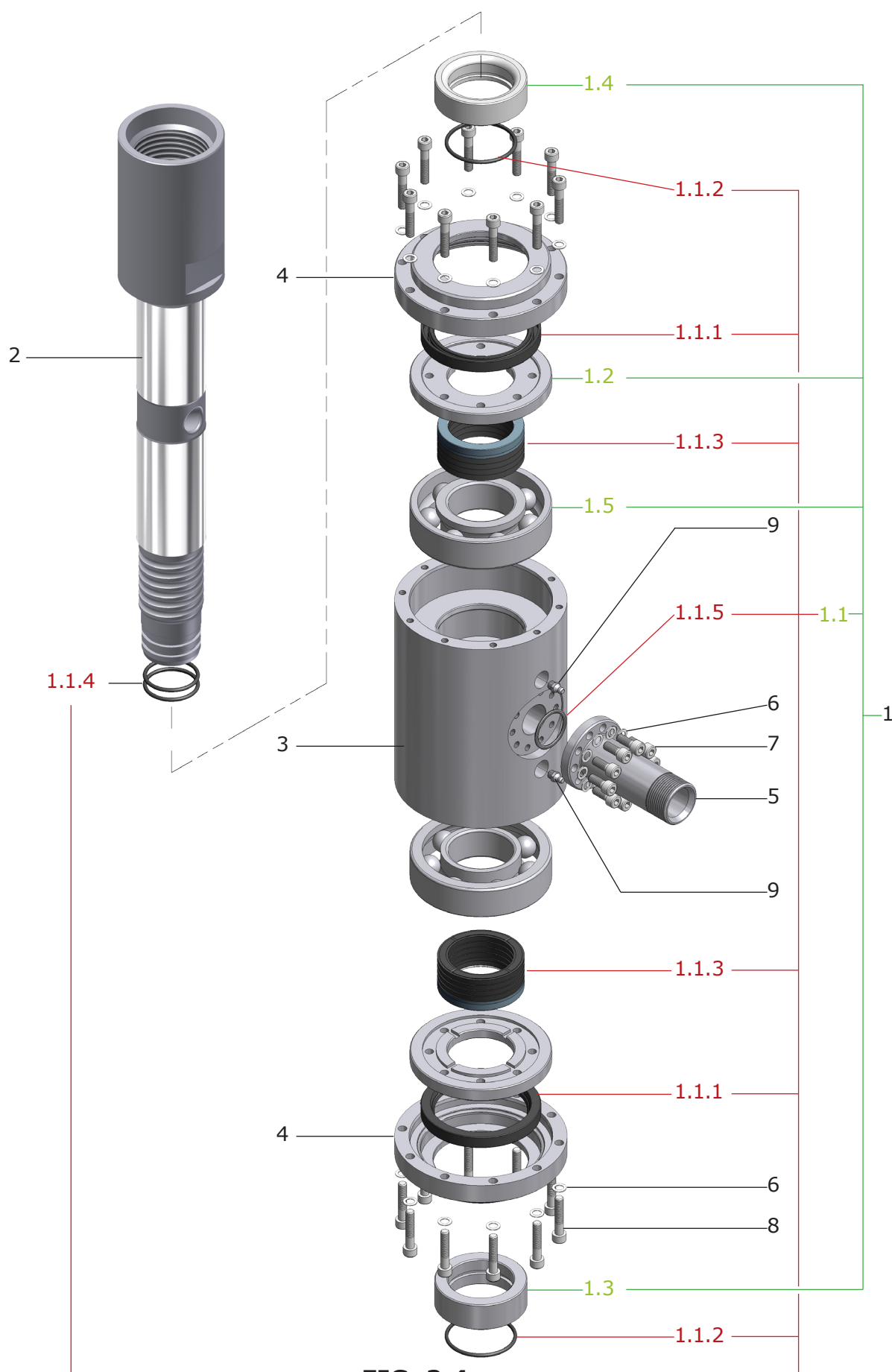


FIG. 2.4

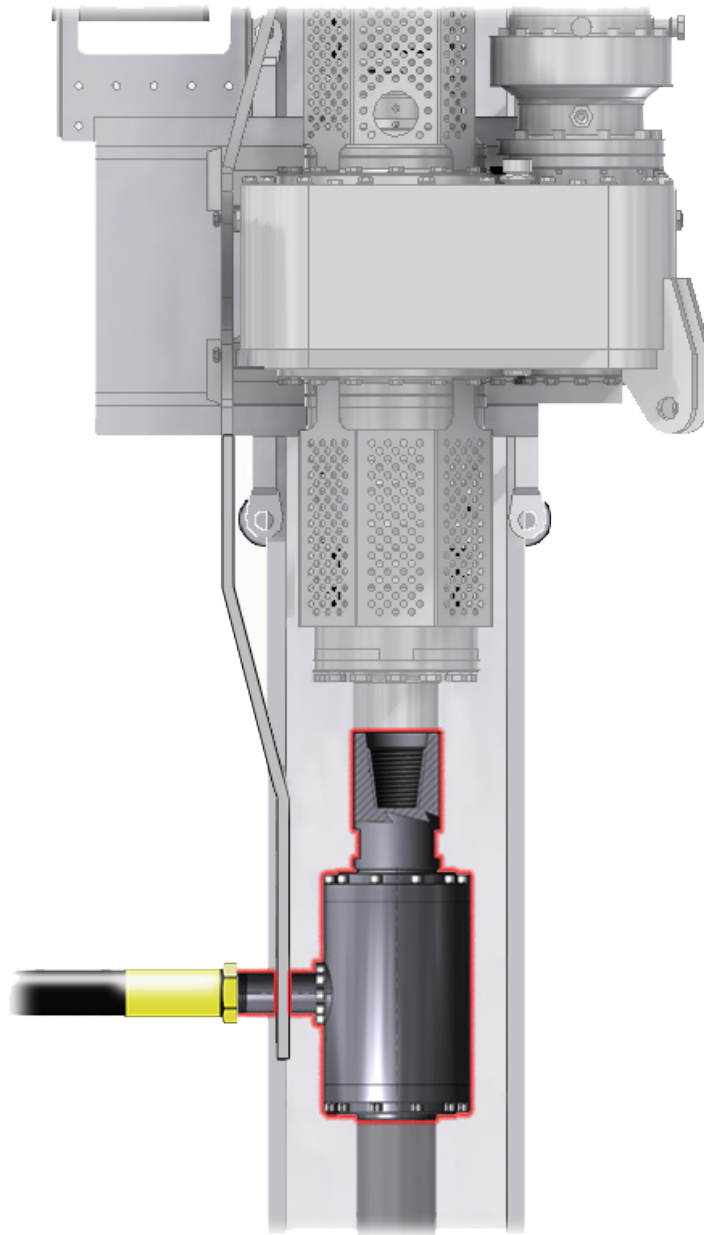




J-SW90278R (REF. FIG. 2.4)

| REF. No. | CODICE CODE        | DESCRIZIONE                         | DESCRIPTION                   | QTY | NOTE |
|----------|--------------------|-------------------------------------|-------------------------------|-----|------|
| 1        | J-SW90278R-S       | KIT RICAMBI SWIVEL J-SW90           | J-SW90 SW. SPARE PARTS KIT    | 1   |      |
| 1.1      | J-SW90278R-K       | KIT GUARN. SWIVEL J-SW90            | J-SW90 SWIVEL SEALS KIT       | 1   |      |
| 1.1.1    | MR-A85X110X12      | PARAOILIO 85X110X12 SING. LAB.      | 85X110X12 ONE LIP SEAL        | 2   | (1)  |
| 1.1.2    | MR-OR229           | OR-229 RIF POLYPAC                  | O-RING 229 SEAL REF POLYPAC   | 2   | (1)  |
| 1.1.3    | MR-SM314236-1AX    | GUARN. SM314236-1AX                 | SM314236-1AX SEAL             | 2   | (1)  |
| 1.1.4    | MR-OR224           | O-RING 224 RIF. POLIPAC             | O-RING 224 SEAL REF. POLIPAC  | 2   | (1)  |
| 1.1.5    | MR-OR126           | O-RING 126 RIF. POLIPAC             | O-RING 126 SEAL REF. POLIPAC  |     | (1)  |
| 1.2      | D-1351-4           | PREMIGUARNIZIONE SWIVEL J-SW90      | J-SW90 SWIVEL SEAL RETAINER   | 2   | (1)  |
| 1.3      | D-1351-5           | DISTANZIALE SWIVEL J-SW90           | J-SW90 SWIVEL SPACER          | 1   | (1)  |
| 1.4      | D-1351-7           | DISTANZ. EST. SWIVEL J-SW90         | J-SW90 SWIVEL EXTERNAL SPACER | 1   | (1)  |
| 1.5      | MR-7312BE          | CUSCINETTO OBL. 7312 BE             | 7312 BE ROLLER BEARING        | 2   | (1)  |
| 2        | D-1351-6-278       | ALBERO SWIVEL SOTTO TESTA 2"-7/8 AR | SWIVEL SHAFT 2"-7/8 AR        | 1   |      |
| 3        | D-1351-1           | CORPO ESTERNO SWIVEL J-SW90         | J-SW90 SWIVEL BODY            | 1   |      |
| 4        | D-1351-3           | FLANGIA PARAOILIO SWIVEL J-SW90     | J-SW90 SW. LIP SEAL FLANGE    | 2   |      |
| 5        | D-0699-3-4-2       | ATTACCO 1"-1/4                      | 1"-1/4 INLET                  | 1   |      |
| 6        | MR-SCHNORR8        | RONDELLA SCHNORR M8                 | SCHNORR M8 WASHER             | 30  |      |
| 7        | 5931M8X20P125129GR | VITE TCEI M8X20 12.9 UNI 5931       | SOCKET SCREW M8X20 12.9       | 10  |      |
| 8        | 5931M8X40P125129GR | VITE TCEI M8X40 12.9 UNI 5931       | SOCKET SCREW M8X40 12.9       | 20  |      |
| 9        | 71412AM8P125       | INGRASSATORE M8                     | M8 LUBRICATOR                 | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio.

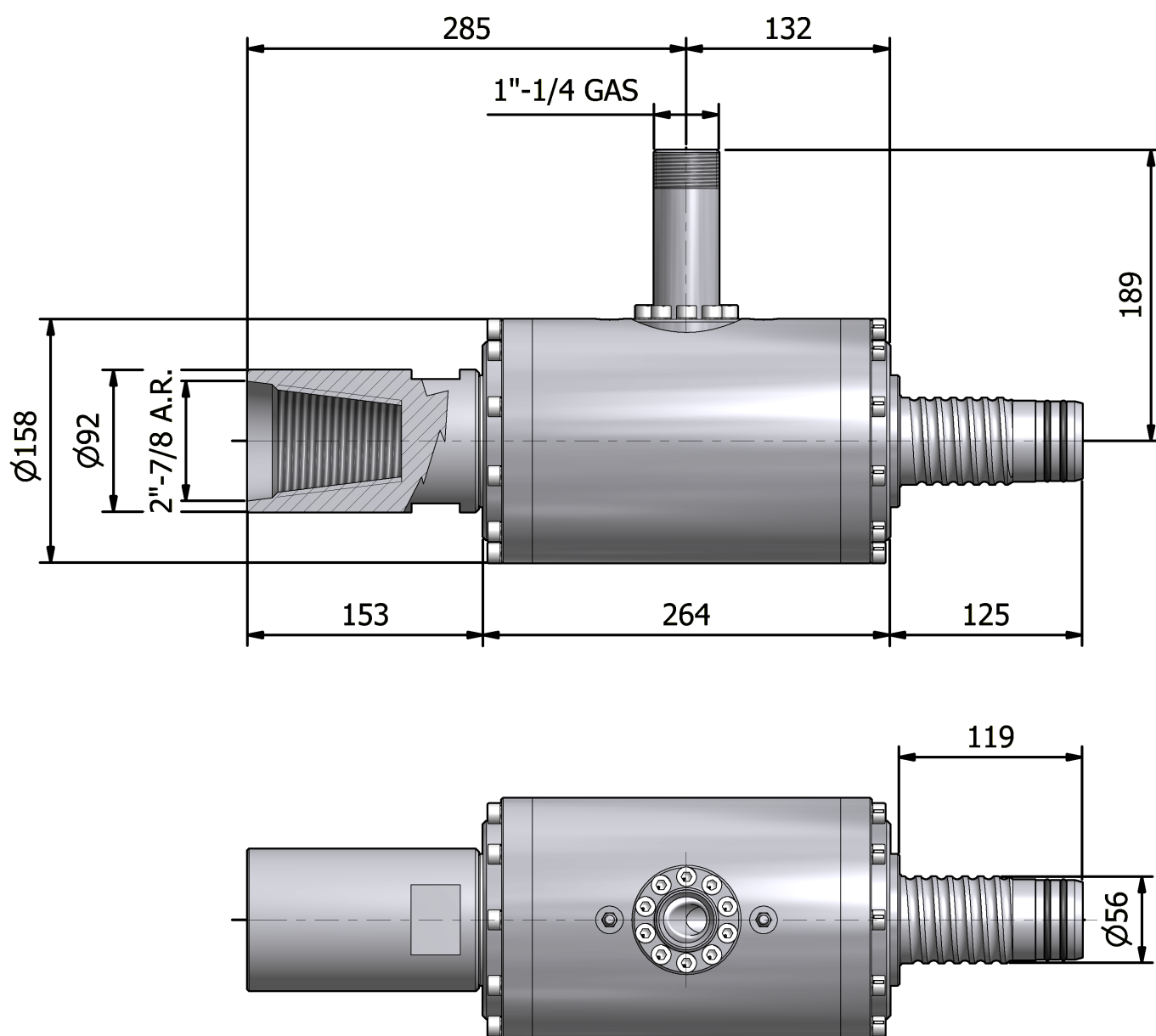
***Washing procedure after jet grouting treatment:***

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

***Maintenance:***

*Lubricate the roller bearings at least every 3h using lithium based grease.*

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-SW90278R                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 80-100 RPM                                                                                                  |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 15 kNm                                                                                                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 42 KG                                                                                                       |



2.5 D.114 H.P. JET SWIVEL (700 L/MIN.-560 BAR): J-8C2TS700

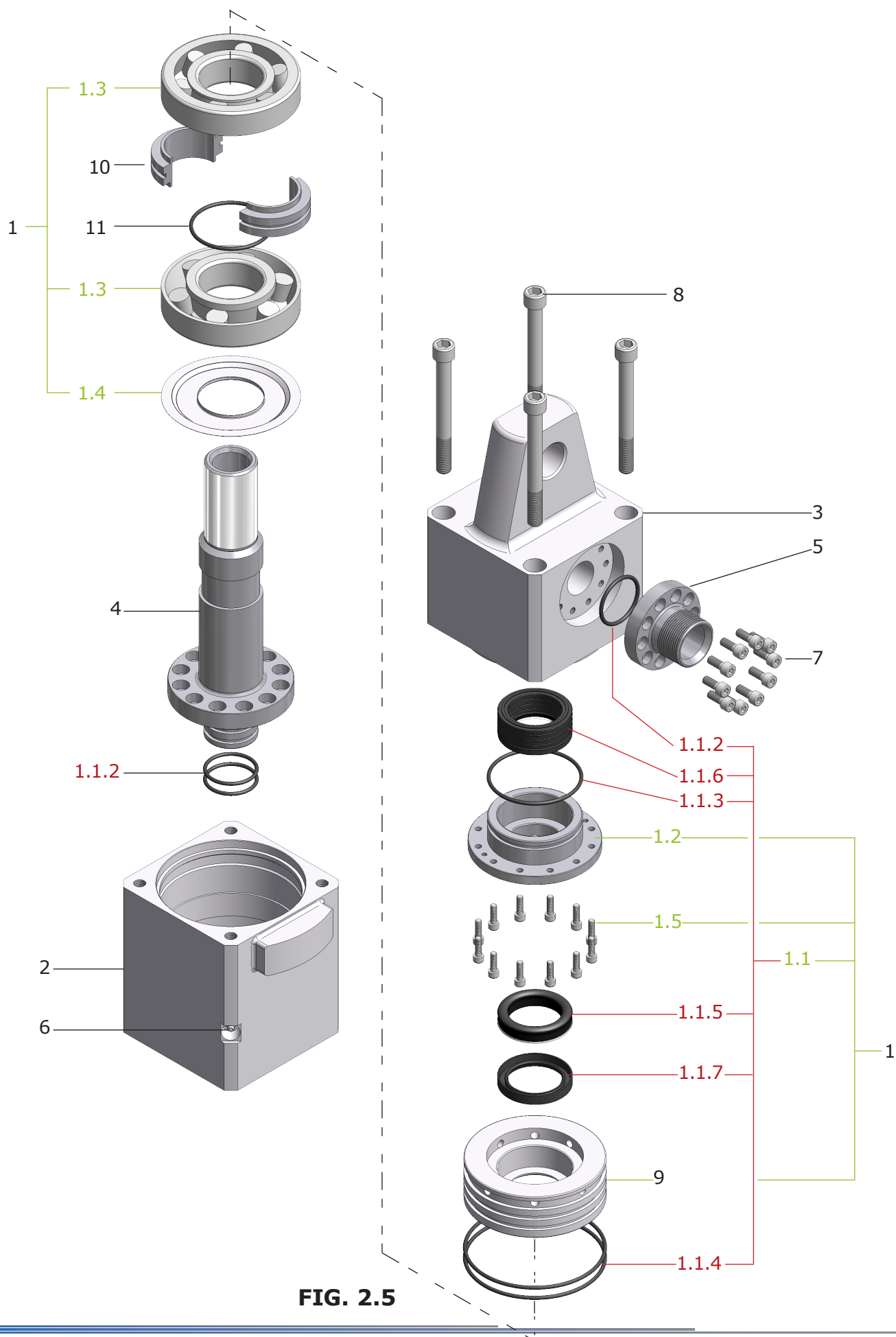


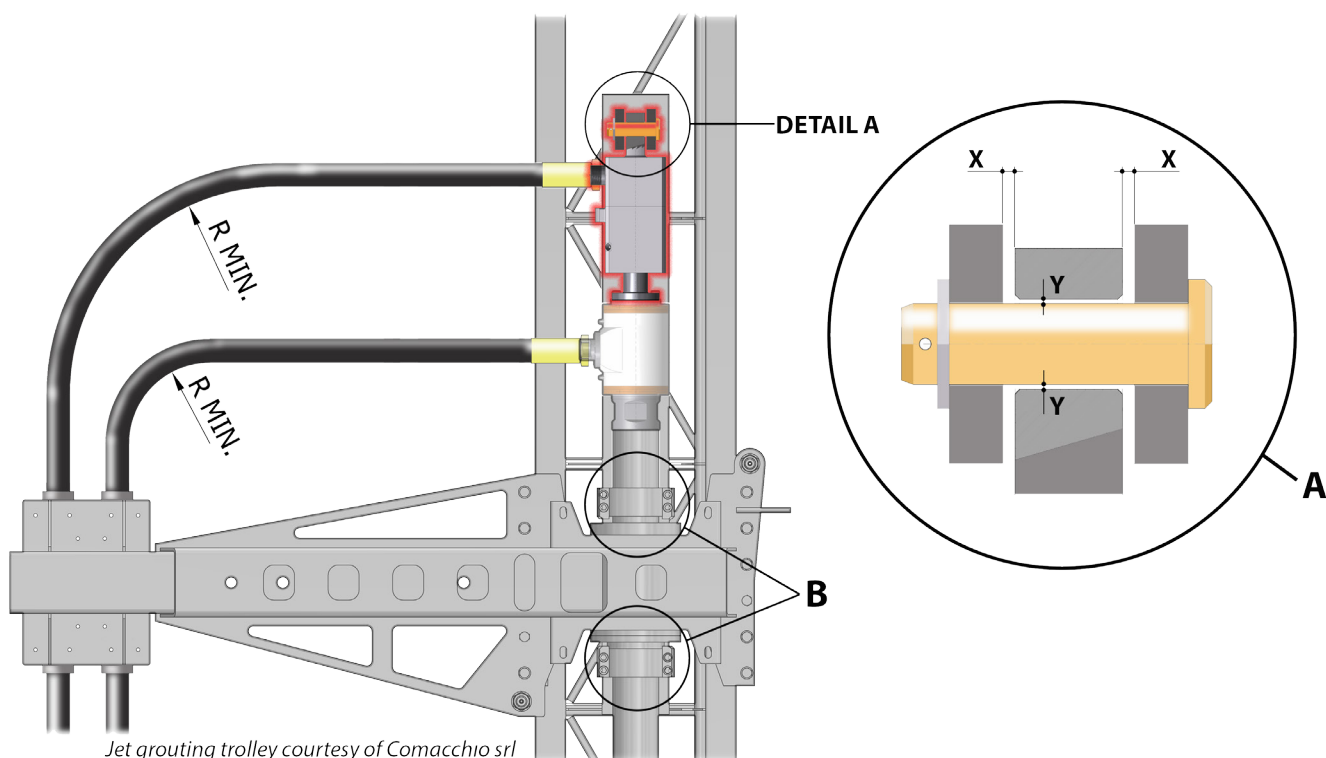
FIG. 2.5

| J-8C2TS700 (REF. FIG. 2.5) |                    |                                 |                                |     |           |
|----------------------------|--------------------|---------------------------------|--------------------------------|-----|-----------|
| REF. No.                   | CODICE CODE        | DESCRIZIONE                     | DESCRIPTION                    | QTY | NOTE      |
| 1                          | J-8C2TS701         | KIT RICAMBI TESTA A.P.          | H.P. SW. SPARE PARTS           | 1   |           |
| 1.1                        | J-8C2TS702         | KIT GUARNIZIONI TESTA A.P.      | H.P. SWIVEL SEALS KIT          | 1   |           |
| 1.1.2                      | MR-OR827           | O-RING RIF POLYPAC 827          | O-RING REF. POLYPAC 827        | 3   | (1)       |
| 1.1.3                      | MR-OR236           | O-RING RIF POLYPAC 236          | O-RING REF. POLYPAC 236        | 1   | (1)(2)    |
| 1.1.4                      | MR-OR249           | O-RING RIF POLYPAC 249          | O-RING REF. POLYPAC 249        | 2   | (1)       |
| 1.1.5                      | MR-DS275196        | GUARN. DS275196 RIF POLYPAC     | DS275196 SEAL REF. POLYPAC     | 1   | (1)(2)    |
| 1.1.6                      | MR-SM275196/1BX    | GUARNIZIONE SM275196/1BX        | SM275196/1BX SEAL REF. POLYPAC | 1   | (1)(2)(3) |
| 1.1.7                      | MR-AS50X70X10      | PARAOLIO AS 50x70x10 UNI5927    | AS LIP SEAL 50x70x10 UNI5927   | 1   | (1)(2)    |
| 1.2                        | J-8C2TS706         | GUIDA PORTA GUARNIZIONI         | H.P. SWIVEL SEALS HOUSING      | 1   | (1)       |
| 1.3                        | MR-30312           | CUSCINETTO 2FB 60x130x33.5      | 2FB 60x130x33.5 BEARING        | 2   | (1)       |
| 1.4                        | MR-30312JV         | ANELLO JV 30312                 | JV RING 30312                  | 1   | (1)       |
| 1.5                        | 5931M6X20P1129GR   | VITE TCCE M6x20 12.9            | SOCKET HEAD SCREW M6x20 12.9   | 12  | (1)       |
| 2                          | J-8C2TS703         | CORPO EST. INF. TESTA           | LOWER EXT. SWIVEL BODY         | 1   |           |
| 3                          | J-8C2TS704         | CORPO SUP TESTA                 | UPPER EXT. SWIVEL BODY         | 1   |           |
| 4                          | J-8C2TS705         | ALBERO TESTA                    | SWIVEL SHAFT                   | 1   |           |
| 5                          | J-8C2TS709         | ATTACCO 1"1/2                   | 1"-1/2 INLET                   | 1   |           |
| 6                          | 71412AM8P125       | INGRASSATORE M8                 | M8 LUBRICATOR                  | 1   |           |
| 7                          | 5931M8X20P125129GR | VITE TCEI M8X20 12.9 UNI 5931   | SOCKET HEAD SCREW M8x20 12.9   | 10  |           |
| 8                          | 5931M14X130P2129GR | VITE TCEI M14X130 12.9 UNI 5931 | SOCKET HEAD SCREW M14x130 12.9 | 4   |           |
| 9                          | J-8C2TS708         | DISTANZIALE PORTA GUARNIZIONI   | SEALS HOUSING SPACER           | 1   |           |
| 10                         | J-8C2TS707         | MEZZALUNA ALBERO TESTA A.P.     | SHAFT HALF RING                | 1   |           |
| 11                         | MR-OR840           | O-RING RIF.POLYPAC 840          | O-RING SEAL REF.POLYPAC 840    | 1   |           |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

(2) KIT GUARNIZIONI CENTRALI TESTA: J-8C2TS702-A - SWIVEL MIDDLE SEALS KIT: J-8C2TS702-A

(3) SOSTITUITO DA MR-CH275196 PER COD. J-8C2TS702-H GUARN. CENTRALI ALTA VELOCITA' - REPLACED BY MR-CH275196 FOR HIGH SPEED MIDDLE SEALS, CODE J-8C2TS702-H



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

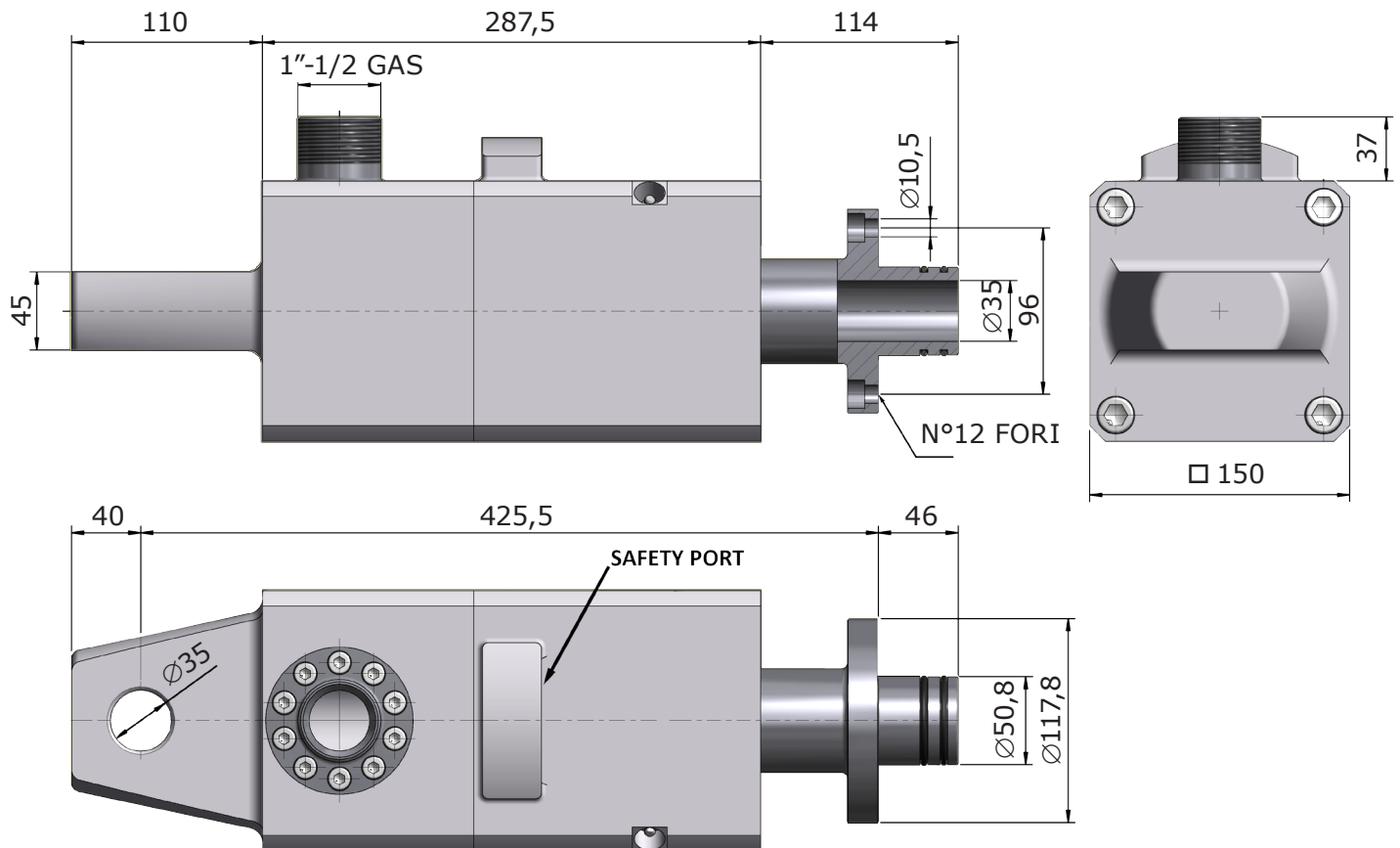
Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8C2TS700                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 85-105 RPM                                                                                                  |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 16 KN                                                                                                       |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 23,5 KG                                                                                                     |



2.6 ROTOPERCUSSION H.P. SWIVEL 65 RPM (210 L/MIN.-500 BAR): J-8JRP5D60

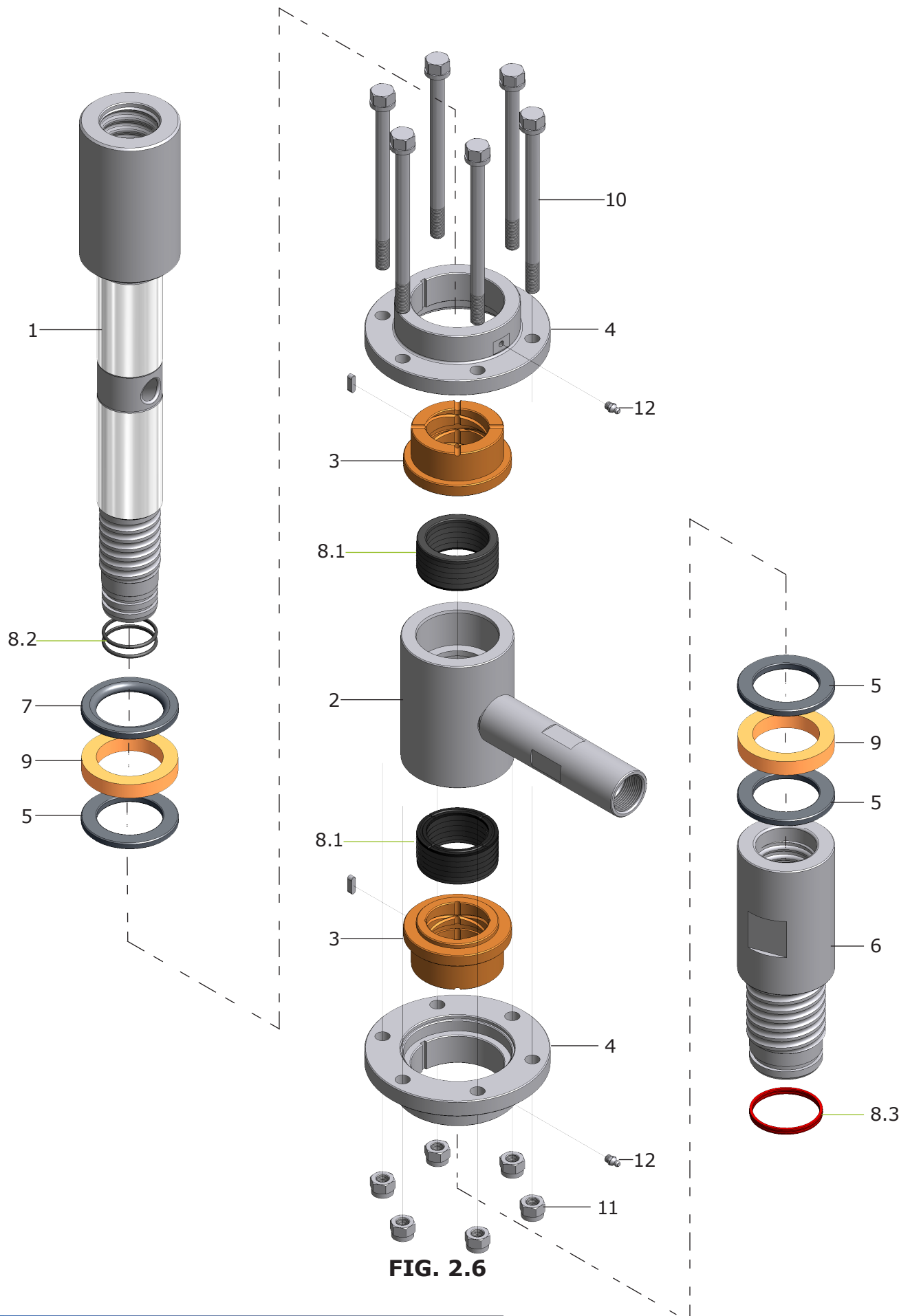


FIG. 2.6

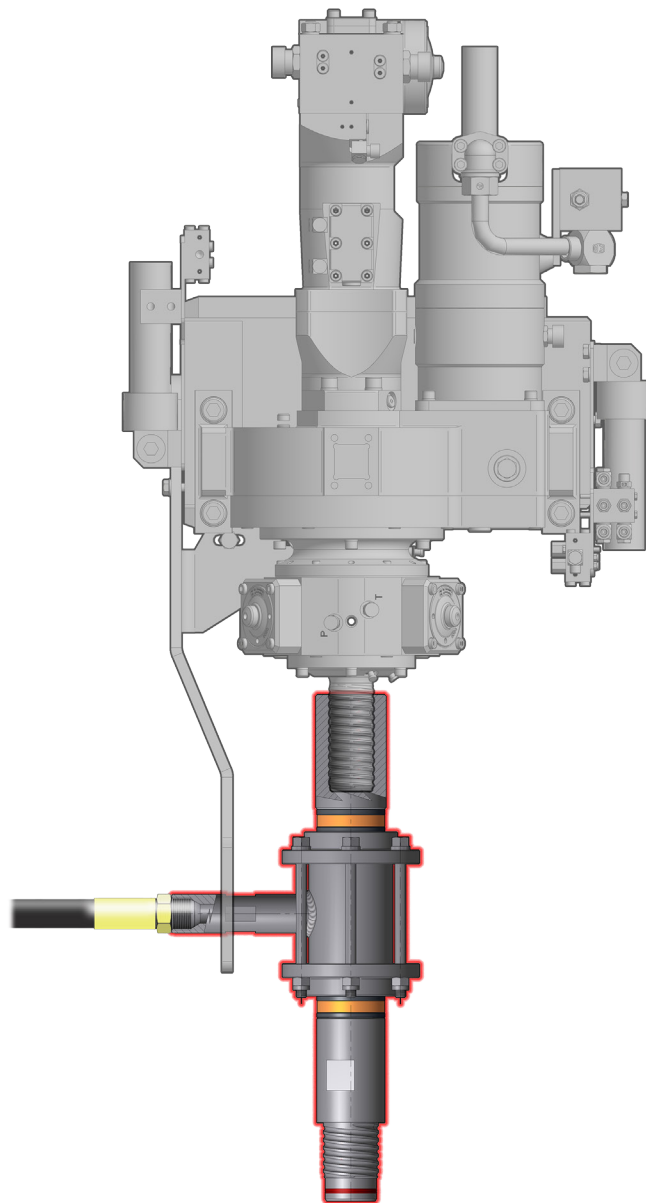




J-8JRP5D60 (REF. FIG. 2.6)

| REF. No. | CODICE CODE  | DESCRIZIONE                     | DESCRIPTION                   | QTY | NOTE |
|----------|--------------|---------------------------------|-------------------------------|-----|------|
| 1        | D-1710-1A    | ALBERO TESTA R.P. D.60 H55      | H55 R.P. D.60 SWIVEL SHAFT    | 1   |      |
| 2        | D-1710-2     | CORPO ESTERNO TESTA R.P.        | EXTERNAL SWIVEL BODY          | 1   |      |
| 3        | D-1710-3     | BRONZINA TESTA R.P. D.60        | D.60 BRONZE BUSHING           | 2   |      |
| 4        | D-1710-4     | FLANGIA TESTA R.P.              | SWIVEL FLANGE                 | 2   |      |
| 5        | D-1710-5     | DISTANZ. TESTA JET R.P.         | R.P. SWIVEL SPACER            | 3   |      |
| 6        | D-1219-6     | RIDUZ. TESTA/D.90 RP JET        | SWIVEL ADAPTER D.90 JET RP    | 1   |      |
| 7        | D-1710-7     | DISTANZ. SUP. TESTA R.P.        | SWIVEL UPPER SPACER           | 1   |      |
| 8        | D-1219-K     | KIT GUARNIZIONI TESTA A.P. R.P. | SWIVEL SEALS KIT              | 1   |      |
| 8.1      | MR-CH314236  | CH314236 RIF POLYPAC            | CH314236 REF. POLYPAC         | 2   | (1)  |
| 8.2      | MR-OR224     | OR-224 RIF POLYPAC              | OR-224 REF. POLYPAC           | 2   | (1)  |
| 8.3      | D-0604-12    | R15-P60.8X67XL5.9 H-ECOPUR      | R15-P60.8X67XL5.9 H-ECOPUR    | 2   | (1)  |
| 9        | D-1710-6     | ANELLO AMMORTIZZANTE            | SHOCK ABSORBER RING           | 2   |      |
| 10       | J-8JRP5007   | TIRANTE TESTA R.P.              | SWIVEL BODY SCREW             | 6   |      |
| 11       | J-8JRP5008   | DADO AUTOBLOCCANTE M14x1,5      | LOCKNUT M14x1,5               | 6   |      |
| 12       | 71412AM8P125 | INGRASSATORE M8                 | M8 LUBRICATOR                 | 2   |      |
| 13       | 6604A6X6X20  | LINGUETTA UNI 6604A 6x6x20      | UNI 6604A 6x6x20 PARALLEL KEY | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

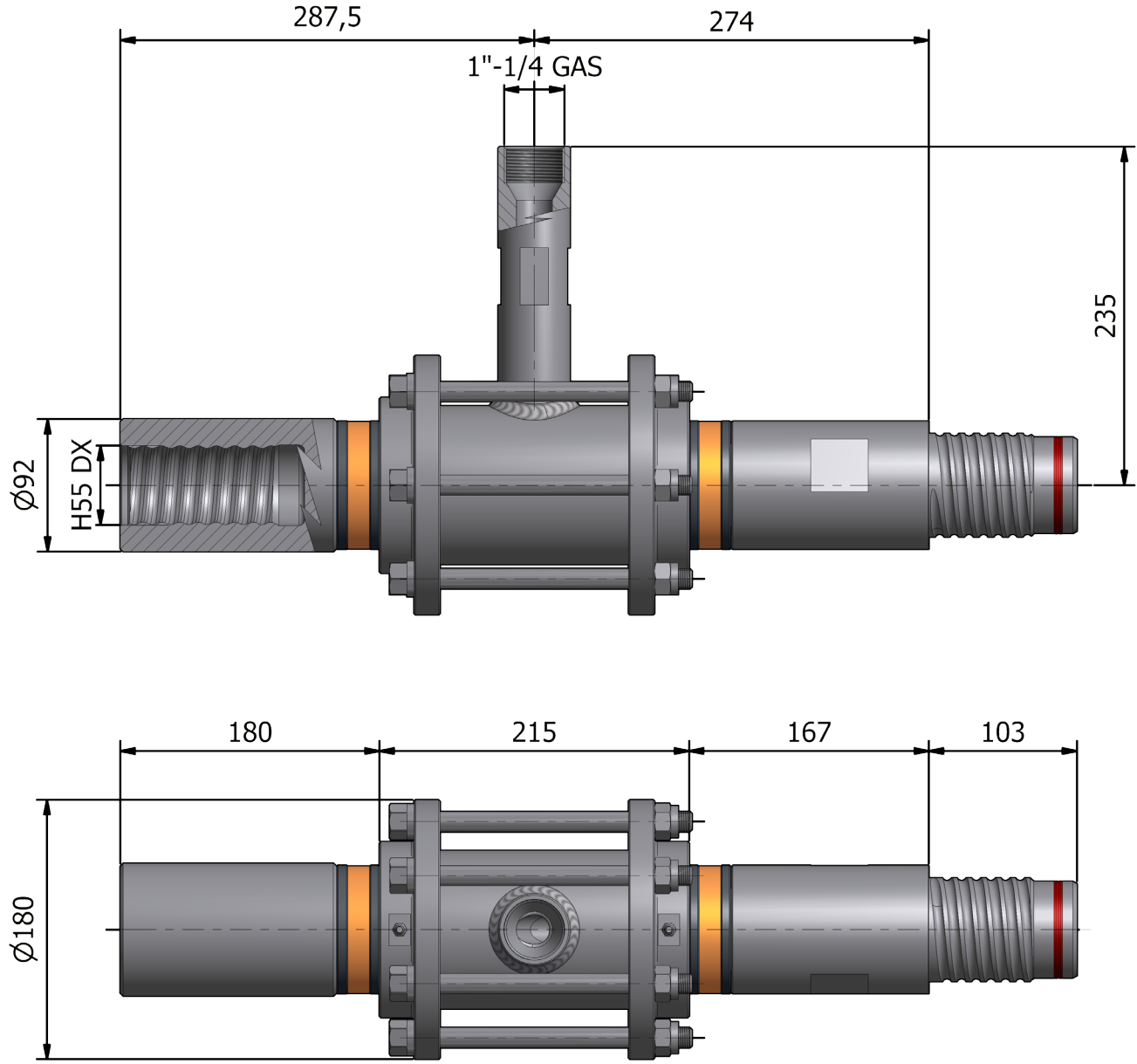
**Washing procedure after jet grouting treatment:**

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

**Maintenance:**

Lubricate the bushings at least every 3h using lithium based grease.

|                                                                                        |                                                                                                                |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8JRP5D60                                                                                                     |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 50 MPa                                                                                                         |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                         |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                                |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                               |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 65 RPM                                                                                                         |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                         |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 15 kNm                                                                                                         |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON<br>OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 39 KG                                                                                                          |



2.7 D.90 ROTOPERCUSION H.P. JET SWIVEL (240 L/MIN.-500 BAR): J-8JRP5000

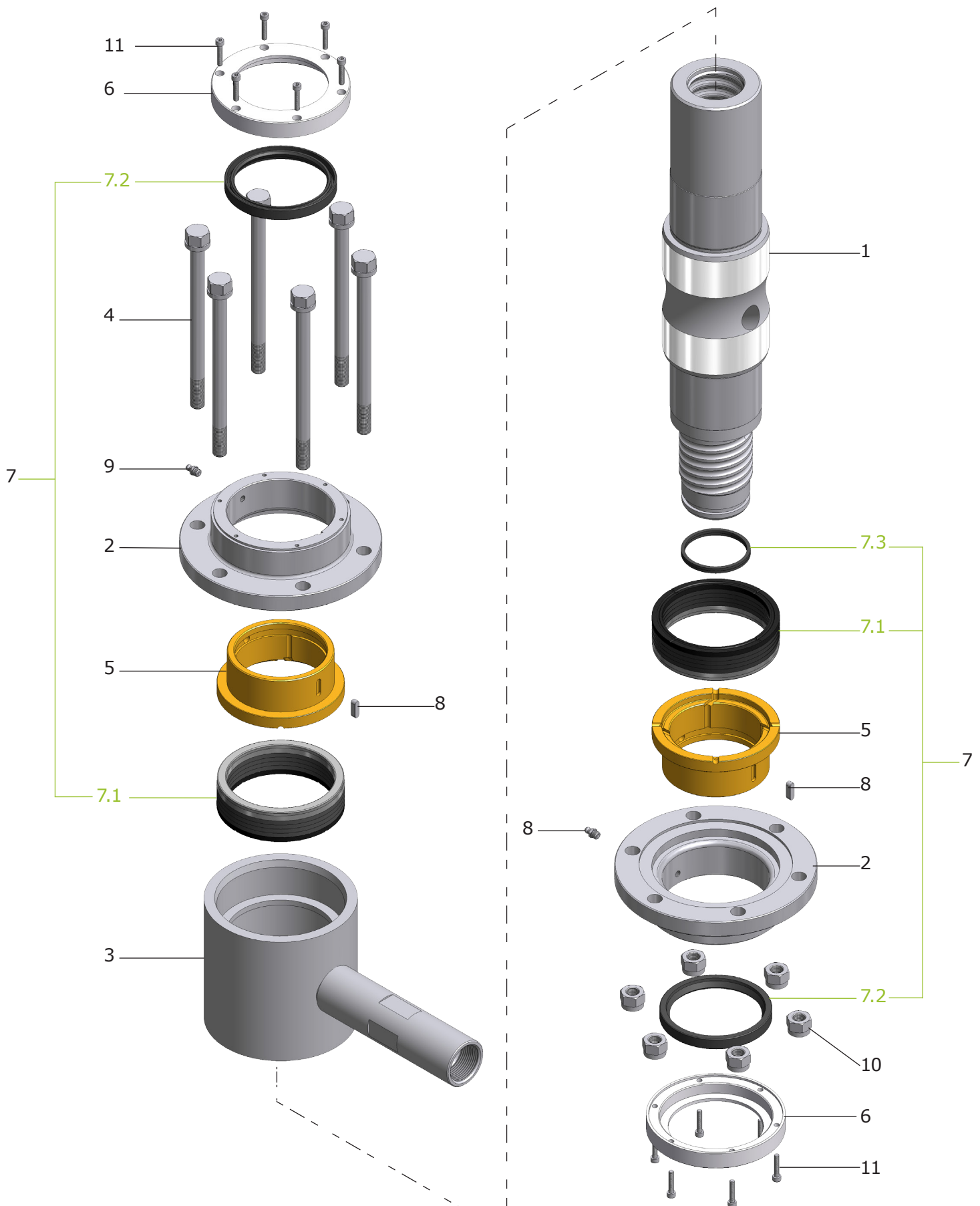


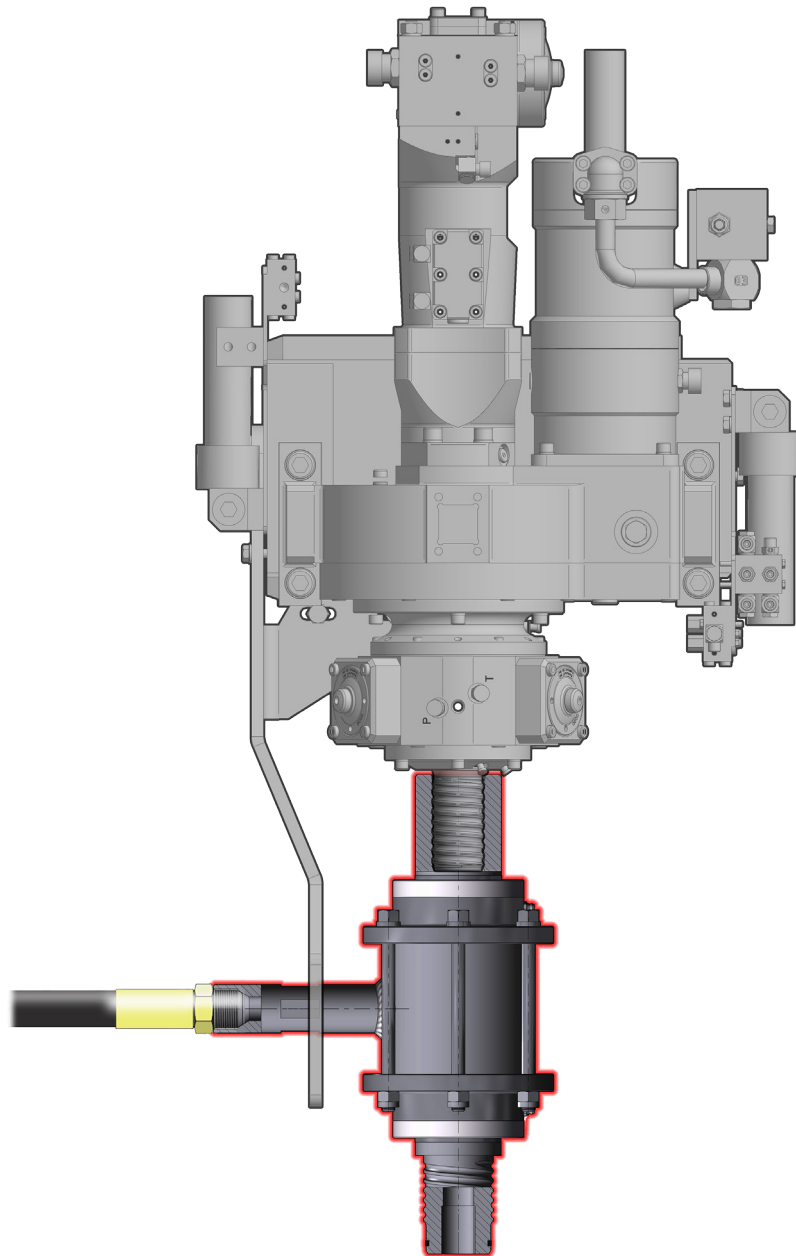
FIG. 2.7



**J-8JRP5000 (REF. FIG. 2.7)**

| REF. No. | CODICE CODE      | DESCRIZIONE                       | DESCRIPTION                | QTY | NOTE |
|----------|------------------|-----------------------------------|----------------------------|-----|------|
| 1        | J-8JRP5003       | ALBERO TESTA A.P. RP              | ROTOP. HP SWIVEL SHAFT     | 1   |      |
| 2        | J-8JRP5004       | FLANGIA TESTA RP                  | SWIVEL FLANGE              | 2   |      |
| 3        | J-8JRP5005       | CORPO EST. TESTA A.P. JET. RP     | EXTERNAL SWIVEL BODY       | 1   |      |
| 4        | J-8JRP5007       | TIRANTE TESTA RP                  | SWIVEL BODY SCREW          | 6   |      |
| 5        | J-8JRP5030       | BRONZINA TESTA RP                 | SWIVEL BRONZE BUSHING      | 2   |      |
| 6        | J-8JRP5009       | FLANGIA PARAOLIO TESTA RP         | LIP SEAL FLANGE            | 2   |      |
| 7        | J-8JRP5002       | KIT GUARNIZIONI TESTA A.P. RP     | ROTOP. HP SWIVEL SEALS KIT | 1   |      |
| 7.1      | MR-CH492413      | CH492413 RIF POLYPAC              | CH492413 REF. POLYPAC      | 2   | (1)  |
| 7.2      | J-8JRP5010       | PARAOLIO SINGOLO LABBRO 110x90x12 | SINGLE LIP SEAL 110x90x12  | 2   | (1)  |
| 7.3      | D-0604-12        | R15-P60.8X67XL5.9 H-ECOPUR        | R15-P60.8X67XL5.9 H-ECOPUR | 1   | (1)  |
| 8        | 6604A6X6X20      | LINGUETTA 6x6x20                  | PARALLEL KEY 6x6x20        | 2   |      |
| 9        | 71412AM8P125     | INGRASSATORE M8                   | M8 LUBRICATOR              | 2   |      |
| 10       | 7473M14P156SZB   | DADO AUTOBL. M14x1.5 UNI 7473     | UNI 7473 M14x1.5 LOCKNUT   | 6   |      |
| 11       | 5931M5X25P0888ZB | VITE TCEI M5x25                   | SOCKET HEAD SCREW M5x25    | 12  |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

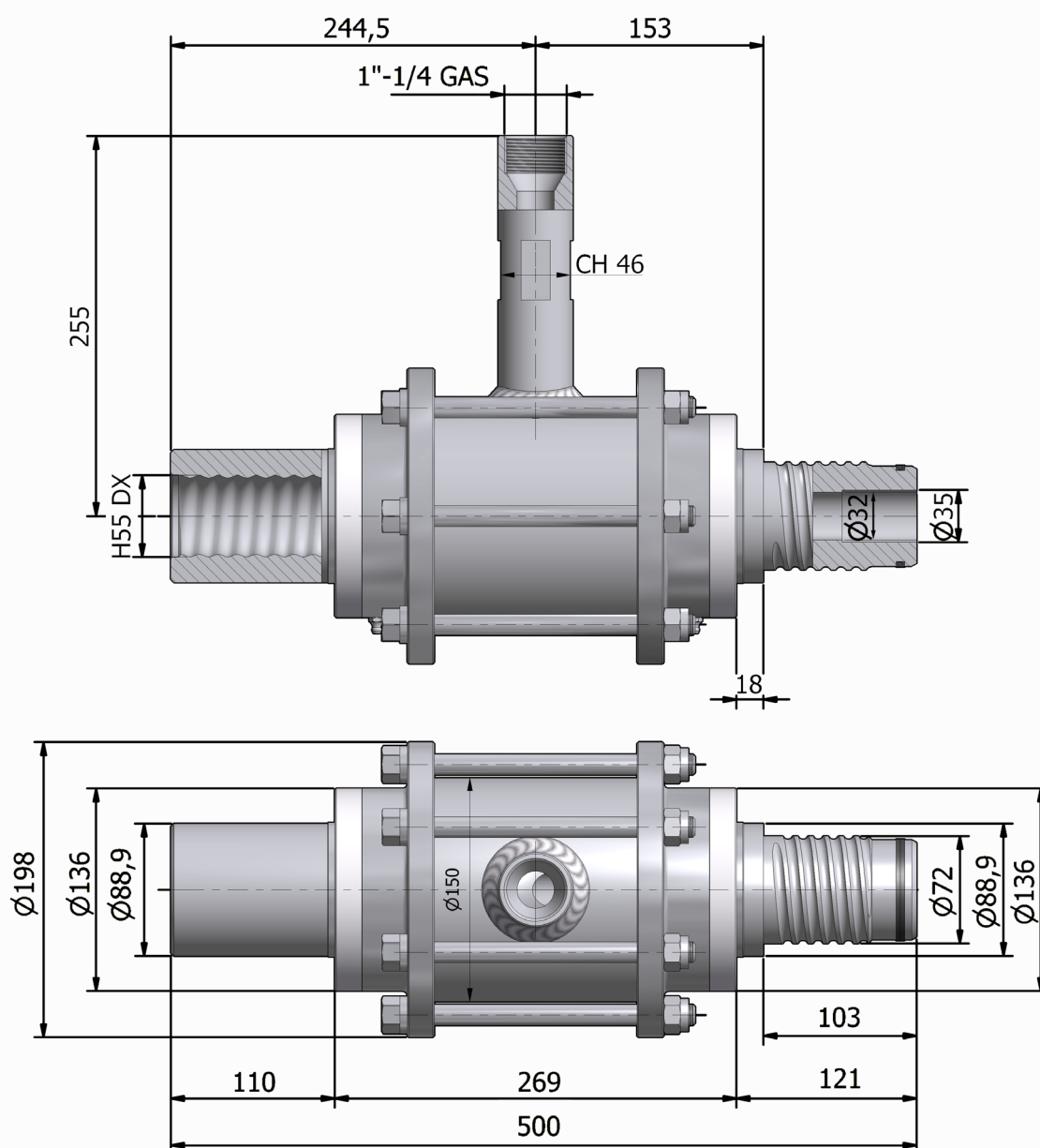
***Washing procedure after jet grouting treatment:***

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

***Maintenance:***

*Lubricate the bushings at least every 3h using lithium based grease.*

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8JRP5000                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 50 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 20 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 35-40 RPM                                                                                                   |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 15 kNm                                                                                                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 42 KG                                                                                                       |



## 2.8 UNDER ROTARY SWIVEL 3"-1/2 A.R.-D.114 JET M/M: J-SW11312R

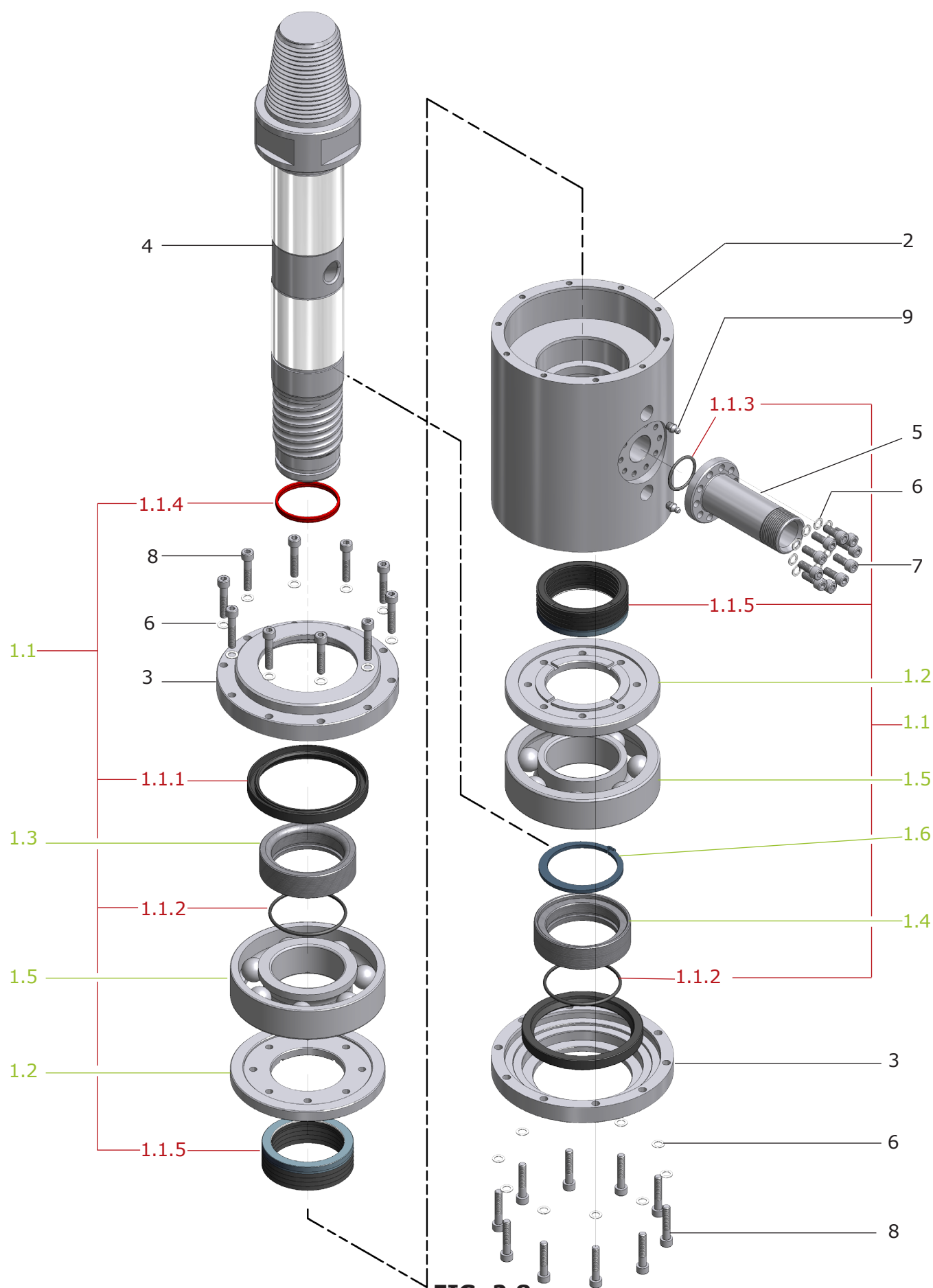
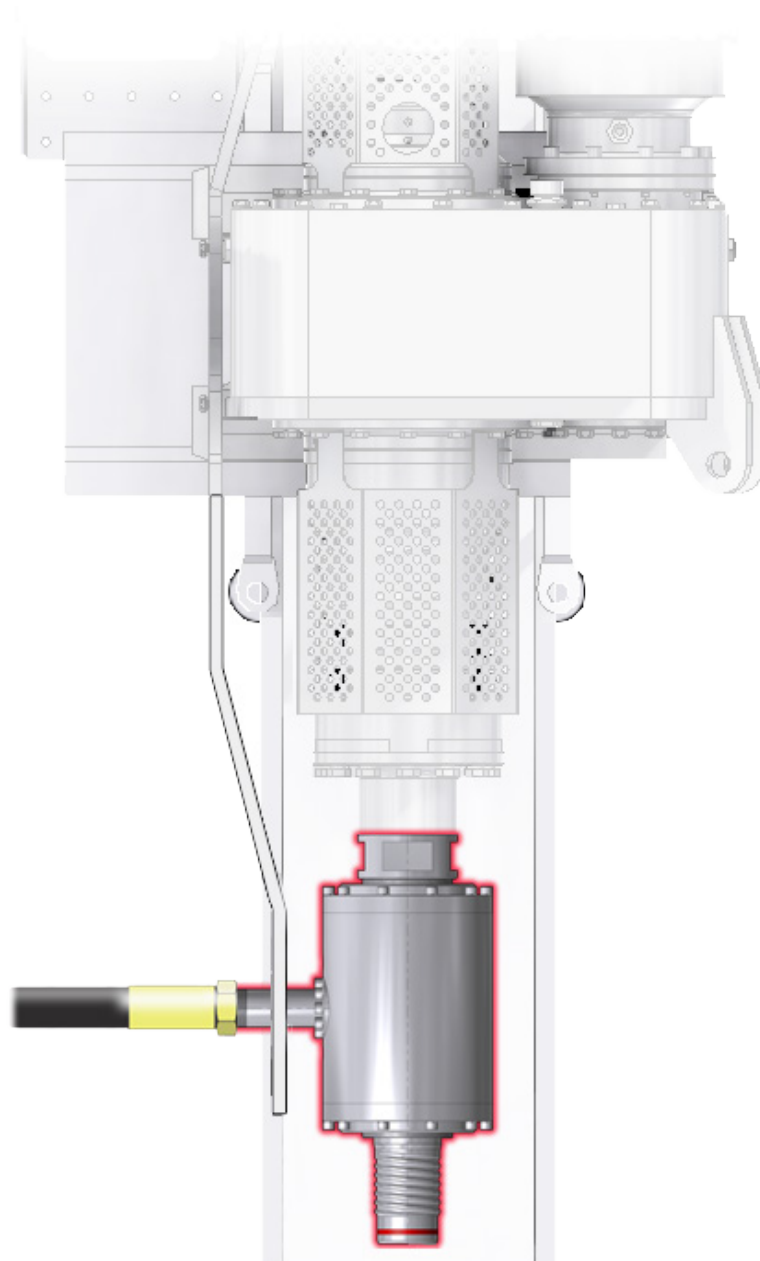


FIG. 2.8



| J-SW11312R (REF. FIG. 2.8) |                   |                                        |                                |     |      |
|----------------------------|-------------------|----------------------------------------|--------------------------------|-----|------|
| REF. No.                   | CODICE CODE       | DESCRIZIONE                            | DESCRIPTION                    | QTY | NOTE |
| 1                          | J-SW11312R-S      | KIT RICAMBI SWIVEL J-SW11              | J-SW11 SWIVEL PARTS KIT        | 1   |      |
| 1.1                        | J-SW11312R-K      | KIT GUARNIZ. SWIVEL J-SW11             | J-SW11 SWIVEL SEALS KIT        | 1   |      |
| 1.1.1                      | MR-A100X125X12    | PARAOLIO 100X125X12 SING.LAB           | 100x125x12 LIP SEAL            | 2   | (1)  |
| 1.1.2                      | MR-OR846          | GUARN O-RING 846 RIF POLYPAC           | O-RING 846 SEAL REF. POLYPAC   | 2   | (1)  |
| 1.1.3                      | MR-OR126          | O-RING 126 RIF POLYPAC                 | O-RING 126 SEAL REF. POLYPAC   | 1   | (1)  |
| 1.1.4                      | D-0604-12         | R15-P60.8X67XL5.9 H-ECOPUR             | R15-P60.8X67XL5.9 H-ECOPUR     | 1   | (1)  |
| 1.1.5                      | MR-SM374295-2CX   | GUARN. SM374295-2CX 75X95X30           | SM374295-2CX 75X95X30 SEAL     | 2   | (1)  |
| 1.2                        | D-1573-4          | PREMIGUARNIZIONI                       | SEALS PLATE                    | 2   | (1)  |
| 1.3                        | D-1573-5          | DISTANZIALE                            | SPACER                         | 1   | (1)  |
| 1.4                        | D-1573-7          | DISTANZIALE ESTERNO                    | EXTERNAL SPACER                | 1   | (1)  |
| 1.5                        | MR-7315BE         | CUSC. OBLIQUO 7315BE 75x160x37         | 7315BE 75x160x37 BEARING       | 2   | (1)  |
| 1.6                        | 7436D75S4         | AN. EL. TIPO RINF. FOR.75 SP.4 UNI7436 | ELASTIC RING D.75 SP.4 UNI7436 | 1   | (1)  |
| 2                          | D-1573-1          | CORPO ESTERNO                          | EXTERNAL BODY                  | 1   |      |
| 3                          | D-1573-3          | FLANGIA                                | FLANGE                         | 2   |      |
| 4                          | D-1573-6          | ALBERO SWIVEL D.75 3"-1/2 ARM          | D.75 3"-1/2 ARM SWIVEL SHAFT   | 1   |      |
| 5                          | D-699-3-4-2       | ATTACCO 1"-1/4 FLANGIATO               | 1"-1/4 FLANGED INLET           | 1   |      |
| 6                          | SCHNORM8ZB        | RONDELLA SHNORR M8                     | M8 SHNORR WASHER               | 30  |      |
| 7                          | 5931M8X20P12588ZB | VITE TCEI UNI5931 M8x20                | UNI5931 M8x20 SOCKET SCREW     | 10  |      |
| 8                          | 5931M8X40P12588ZB | VITE TCEI UNI5931 M8x40                | UNI5931 M8x40 SOCKET SCREW     | 20  |      |
| 9                          | 71412AM8P125      | INGRASSATORE M8                        | M8 LUBRICATOR                  | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio.

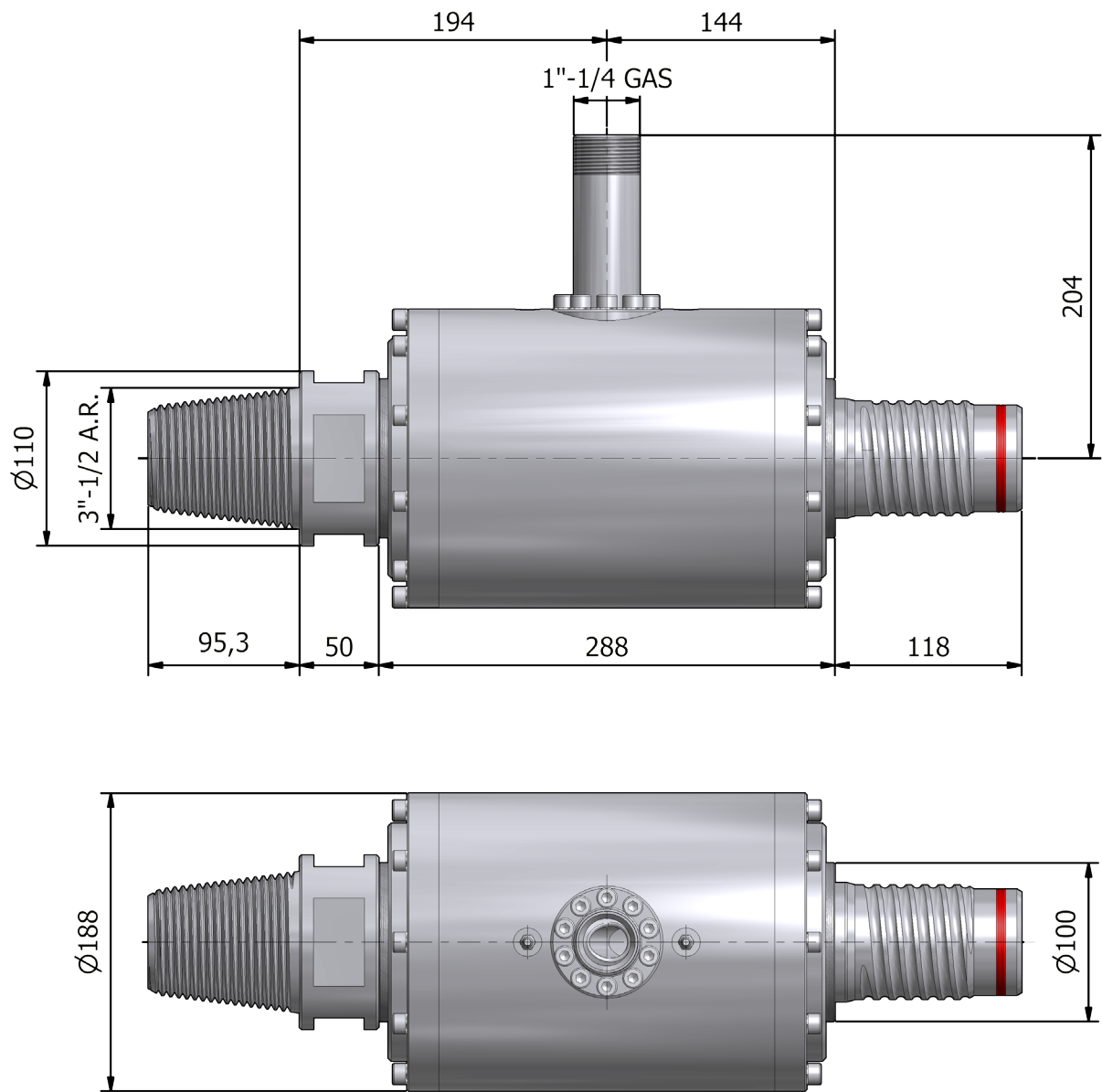
***Washing procedure after jet grouting treatment:***

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

***Maintenance:***

*Lubricate the roller bearings at least every 3h using lithium based grease.*

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-SW11312R                                                                                                  |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 50 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 80 RPM                                                                                                      |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 21 kNm                                                                                                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 60 KG                                                                                                       |



2.9 D.114 ROTOP. JET SWIVEL H90 THREAD (410 L/MIN.-560 BAR): J-11JRP90

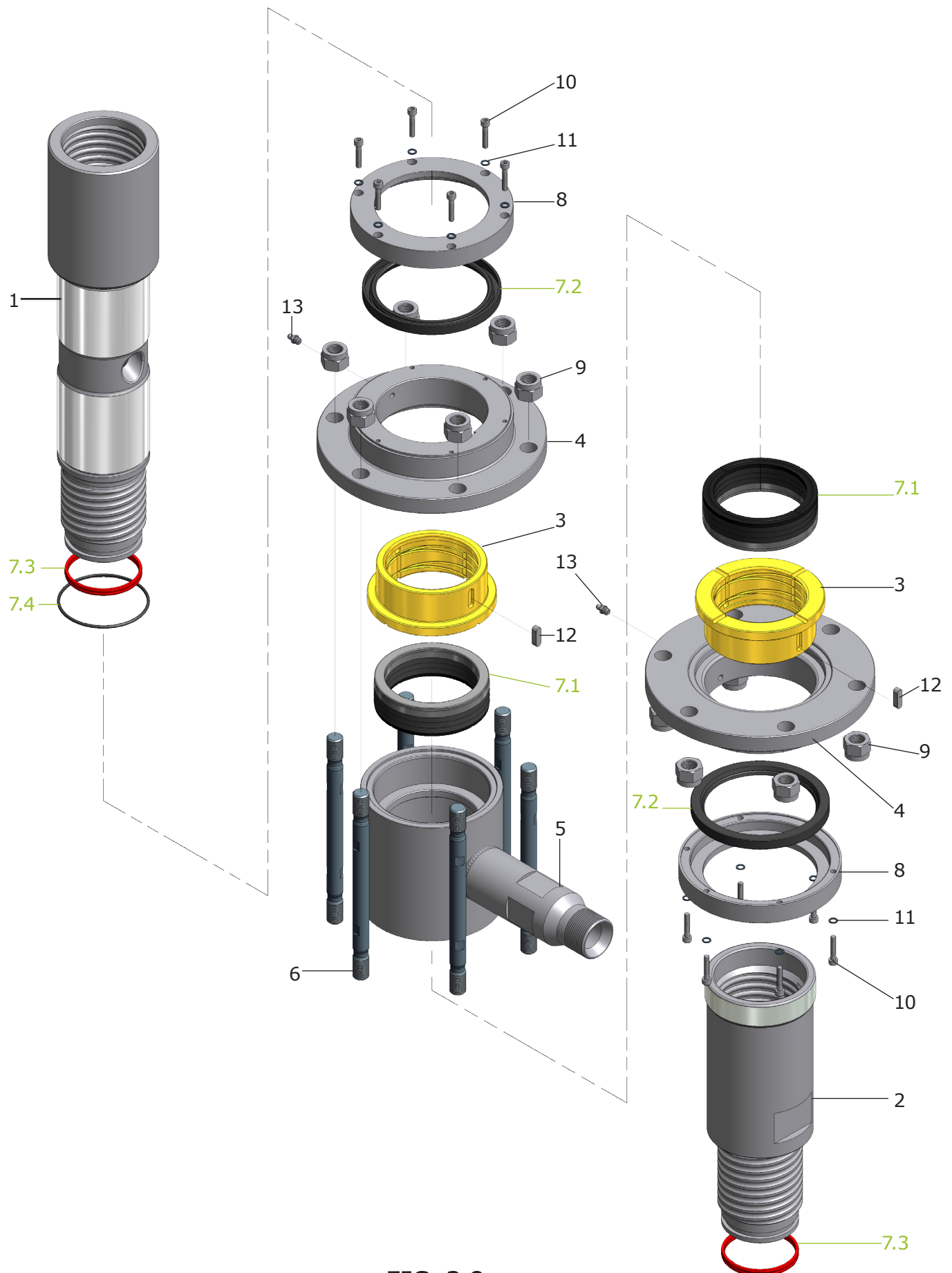


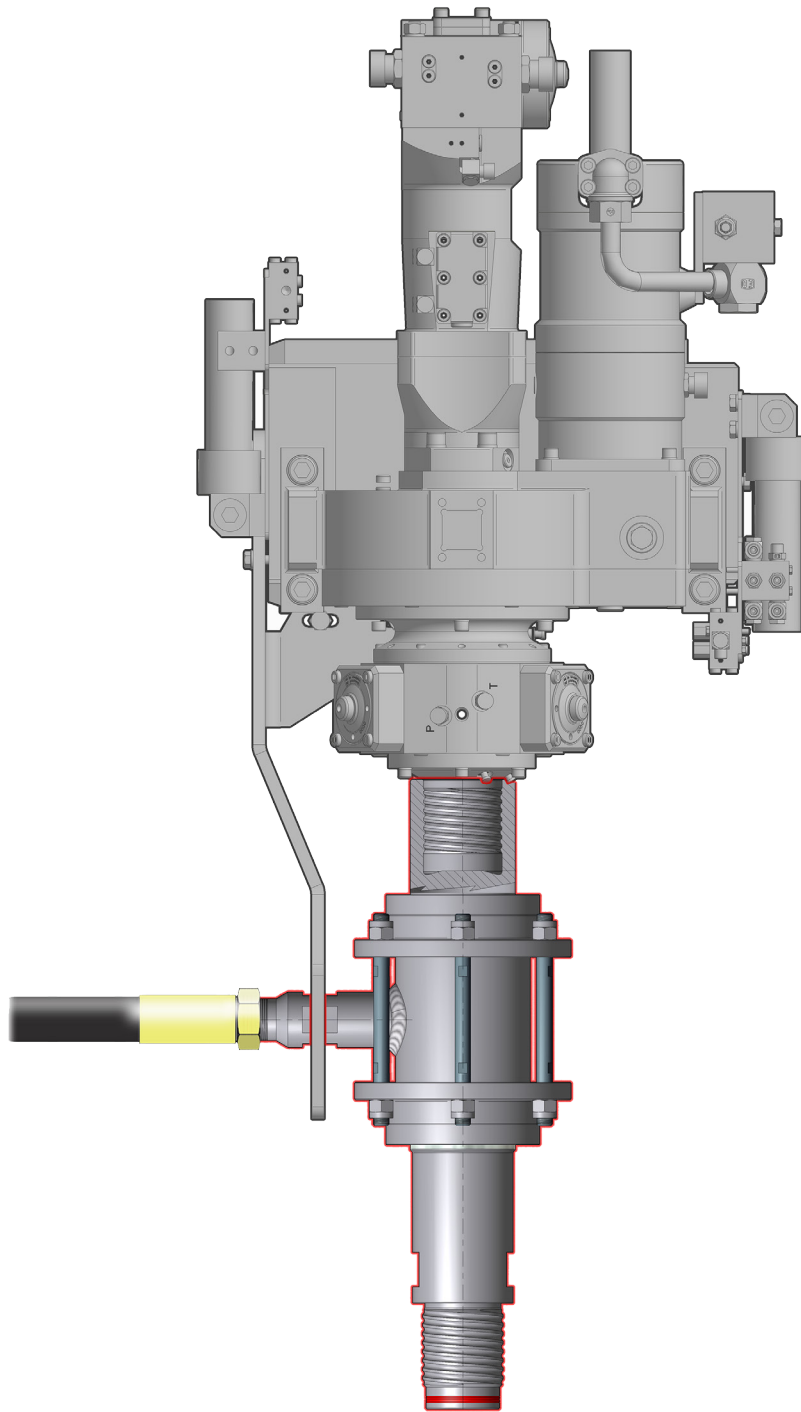
FIG. 2.9



J-11JRP90 (REF. FIG. 2.9)

| REF. No. | CODICE CODE      | DESCRIZIONE                       | DESCRIPTION                      | QTY | NOTE |
|----------|------------------|-----------------------------------|----------------------------------|-----|------|
| 1        | D-1707-20-1      | ALBERO TESTA D.114 JET RP         | D.114 ROTOP. HP JET SWIVEL SHAFT | 1   |      |
| 2        | D-1707-20-2      | MANICOTTO INF. D.114 JET RP M     | SWIVEL LOWER MALE COUPLING       | 1   |      |
| 3        | D-1571-6-3       | BRONZINA TESTA D.114 JET RP       | SWIVEL BRONZE BUSHING            | 2   |      |
| 4        | D-1571-6-5       | FLANGIA TESTA D.114 JET RP        | D.114 ROTOP. JET SWIVEL FLANGE   | 2   |      |
| 5        | D-1571-6-11      | CORPO EST. TESTA D.114 JET RP     | EXTERNAL SWIVEL BODY             | 1   |      |
| 6        | D-1707-20-13     | TIRANTE TESTA D.114 JET RP        | SWIVEL BODY SCREW                | 6   |      |
| 7        | J-11JRPC90-K     | KIT GUARN. TESTA D.114 JET RP     | D.114 JET RP SWIVEL SEALS KIT    | 1   |      |
| 7.1      | MR-CH492393      | CH492393 125x100x36.9 RIF POLYPAC | CH492393 REF. POLYPAC            | 2   | (1)  |
| 7.2      | MR-A120X150X12   | PARAOILIO SING. LABBRO 150x120x12 | SINGLE LIP SEAL 150x120x12       | 2   | (1)  |
| 7.3      | R15-P76X84XL7.7  | R15-P 76x84xL7.7 H-ECOPUR         | R15-P 76x84xL7.7 H-ECOPUR        | 2   | (1)  |
| 7.4      | MR-OR239         | O-RING 239 RIF. POLYPAC           | O-RING 239 REF. POLYPAC          | 1   | (1)  |
| 8        | D-1561-6-10      | FLANGIA PARAOILIO                 | LIP SEAL FLANGE                  | 2   |      |
| 9        | 7473M18P156SZB   | DADO UNI 7473 M18x1.5             | UNI 7473 M18x1.5 LOCKNUT         | 12  |      |
| 10       | 5931M6X30P1129GR | VITE TCEI M6x30 CL.12.9           | SOCKET HEAD SCREW M6x30 12.9     | 12  |      |
| 11       | SCHNORM6ZB       | RONDELLA SHNORR M6                | M6 SHNORR WASHER                 | 12  |      |
| 12       | 6604A7X8X25      | LINGUETTA 8x7x25                  | PARALLEL KEY 8x7x25              | 2   |      |
| 13       | 71412AM8P125     | INGRASSATORE M8                   | M8 LUBRICATOR                    | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

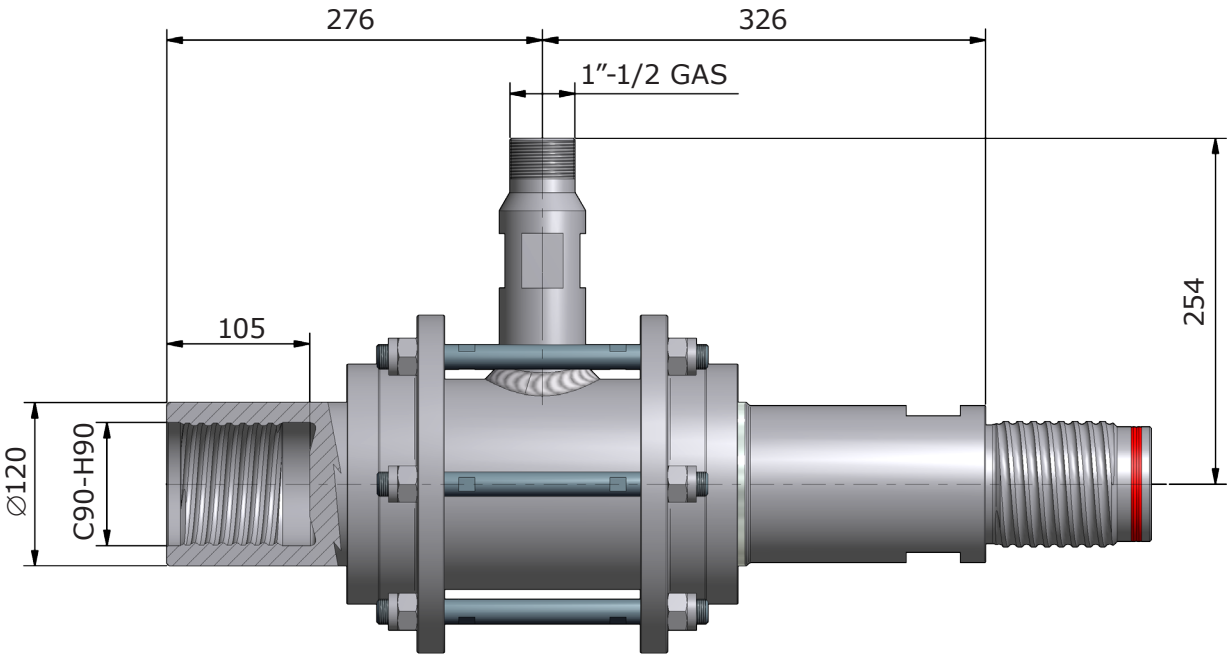
**Washing procedure after jet grouting treatment:**

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

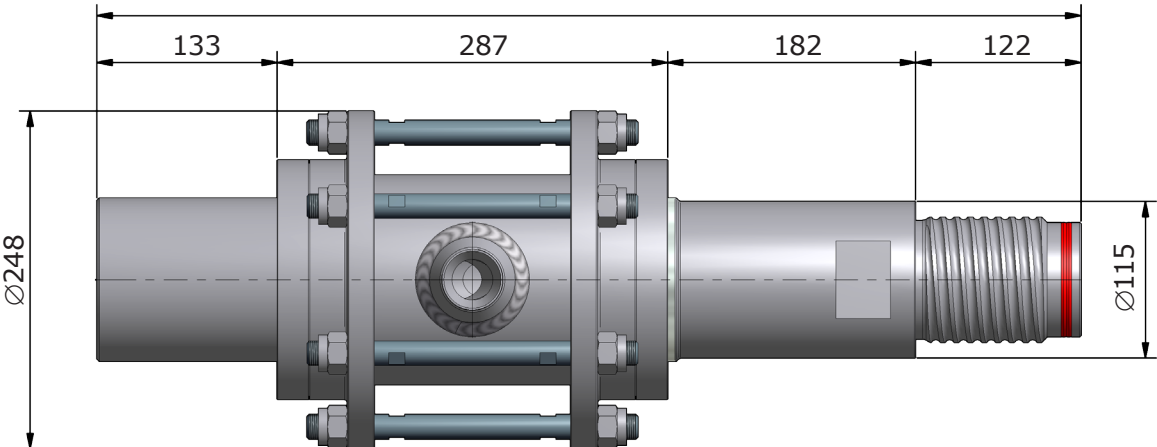
**Maintenance:**

Lubricate the bushings at least every 3h using lithium based grease.

|                                                                                        |                                                                                                             |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-11JRP90                                                                                                   |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 50 MPa                                                                                                      |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                      |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                             |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 20 RPM (MAX 2 h)                                                                                            |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 30-35 RPM                                                                                                   |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                      |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 25 kNm                                                                                                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPPORTO C:A NON OLTRE 1,4)<br>WATRE AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 78 KG                                                                                                       |



723



2.10 L.P. D.90 C2 AIR SWIVEL: J-8C214550

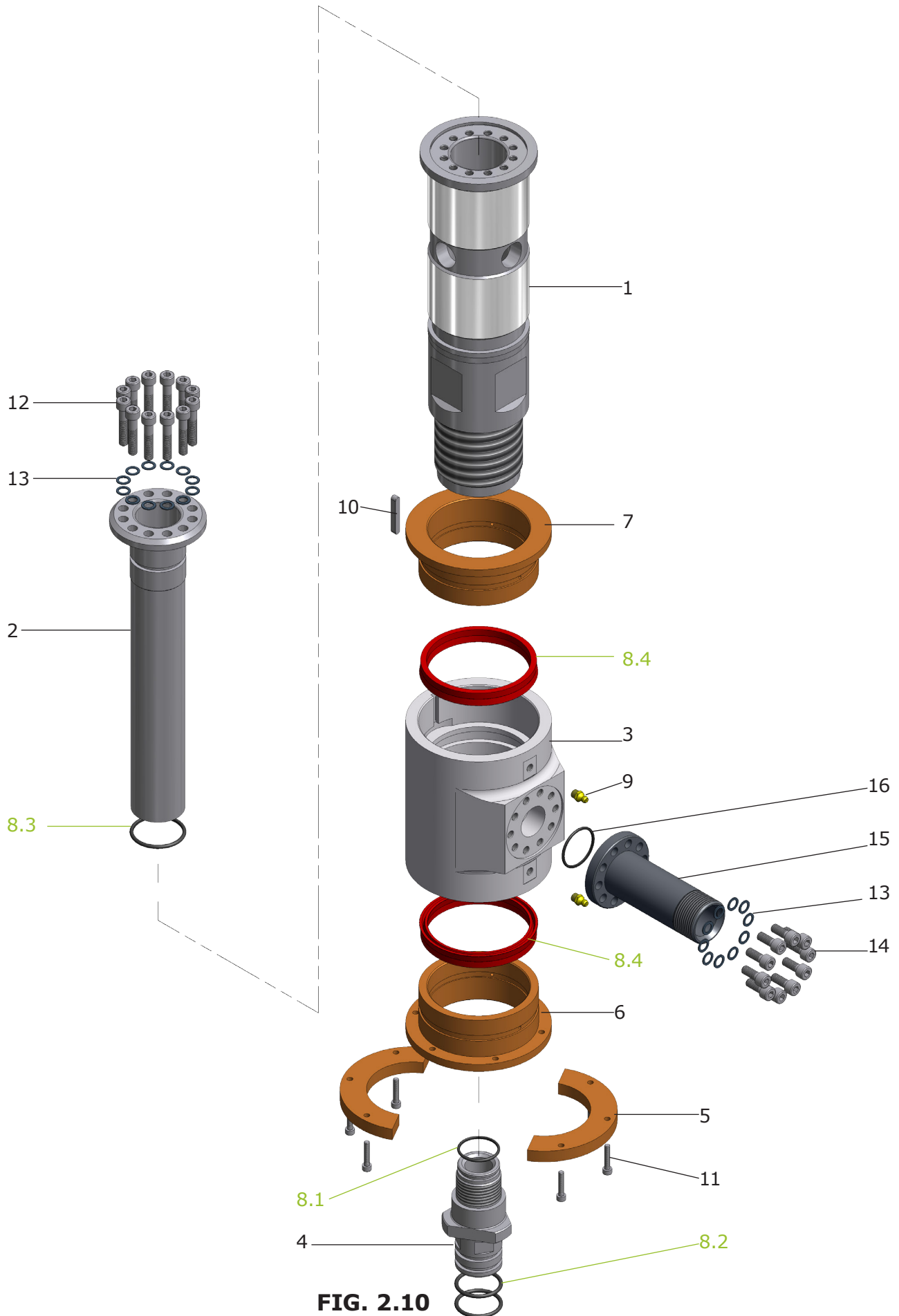


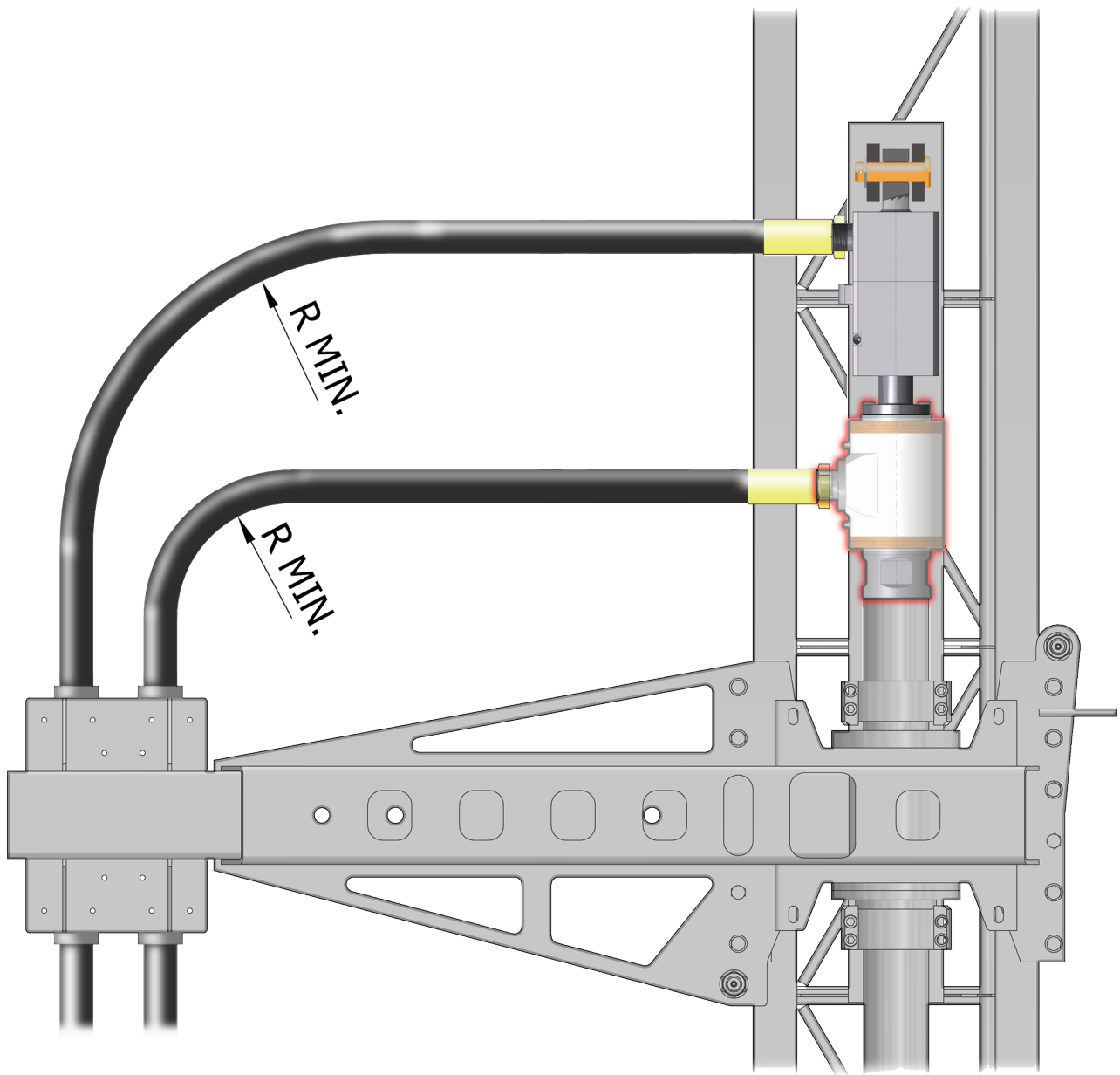
FIG. 2.10



J-8C214550 (REF. FIG. 2.10)

| REF. No. | CODICE CODE        | DESCRIZIONE                       | DESCRIPTION                     | QTY | NOTE |
|----------|--------------------|-----------------------------------|---------------------------------|-----|------|
| 1        | J-8C214552         | ALBERO TESTA B.P. C2              | L.P. SWIVEL SHAFT C2 TYPE       | 1   |      |
| 2        | J-8C214555         | ALBERO INT. TESTA B.P. C2         | L.P. SWIVEL INNER SHAFT C2 TYPE | 1   |      |
| 3        | J-8C214553         | CORPO TESTA B.P. C2 MAX D. 90     | L.P. SWIVEL BODY C2 TYPE        | 1   |      |
| 4        | J-8C214513         | MANICOTTO TESTA B.P.              | L.P. SWIVEL COUPLING            | 1   |      |
| 5        | J-8C214507         | BRONZINA 1/2 TESTA B.P.           | HALF BRONZE BUSHING             | 1+1 |      |
| 6        | J-8C214506         | BRONZINA TESTA B.P.               | BRONZE BUSHING                  | 1   |      |
| 7        | J-8C214505         | BRONZINA TESTA B.P. SUPERIORE     | UPPER BRONZE BUSHING            | 1   |      |
| 8        | J-8C214551         | KIT GUARNIZ. TESTA ARIA/B.P. C2   | C2 AIR L.P. SWIVEL SEALS KIT    | 1   |      |
| 8.1      | MR-OR125           | O-RING RIF. POLYPAC 125           | O-RING REF. POLYPAC 125         | 1   | (1)  |
| 8.2      | MR-OR220           | O-RING RIF. POLYPAC 220           | O-RING REF. POLYPAC 220         | 2   | (1)  |
| 8.3      | MR-OR826           | O-RING RIF. POLYPAC 826           | O-RING REF. POLYPAC 826         | 1   | (1)  |
| 8.4      | MR-MUP10590        | GUARNIZ. MU/P 105/90 RIF. POLYPAC | MU/P SEAL 105/90 RIF. POLYPAC   | 2   | (1)  |
| 9        | 71412AM8P125       | INGRASSATORE M8                   | M8 LUBRICATOR                   | 2   |      |
| 10       | 6604A6X6X40        | LINGUETTA 6x6x40                  | 6x6x40 PARALLEL KEY             | 1   |      |
| 11       | 5931M5X25P0888ZB   | VITE TCEI M5x25                   | SOCKET SCREW M5x25              | 6   |      |
| 12       | 5931M8X40P125129GR | VITE TCEI M8x40 12.9 UNI5931      | SOCKET SCREW M8x40 12.9 UNI5931 | 12  |      |
| 13       | SCHNORM8ZB         | RONDELLA SCHNORR D.8              | D.8 SHNORR WASHER               | 22  |      |
| 14       | 5931M8X20P125129GR | VITE TCEI M8x20 12.9              | SOCKET SCREW M8x20 12.9 UNI5931 | 10  |      |
| 15       | D-0699-3-4-2       | ATTACCO TESTA ARIA 1"-1/4         | 1"-1/4 AIR INLET                | 1   |      |
| 16       | MR-OR126           | O-RING 126 RIF POLYPAC            | O-RING 126 REF. POLYPAC         | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

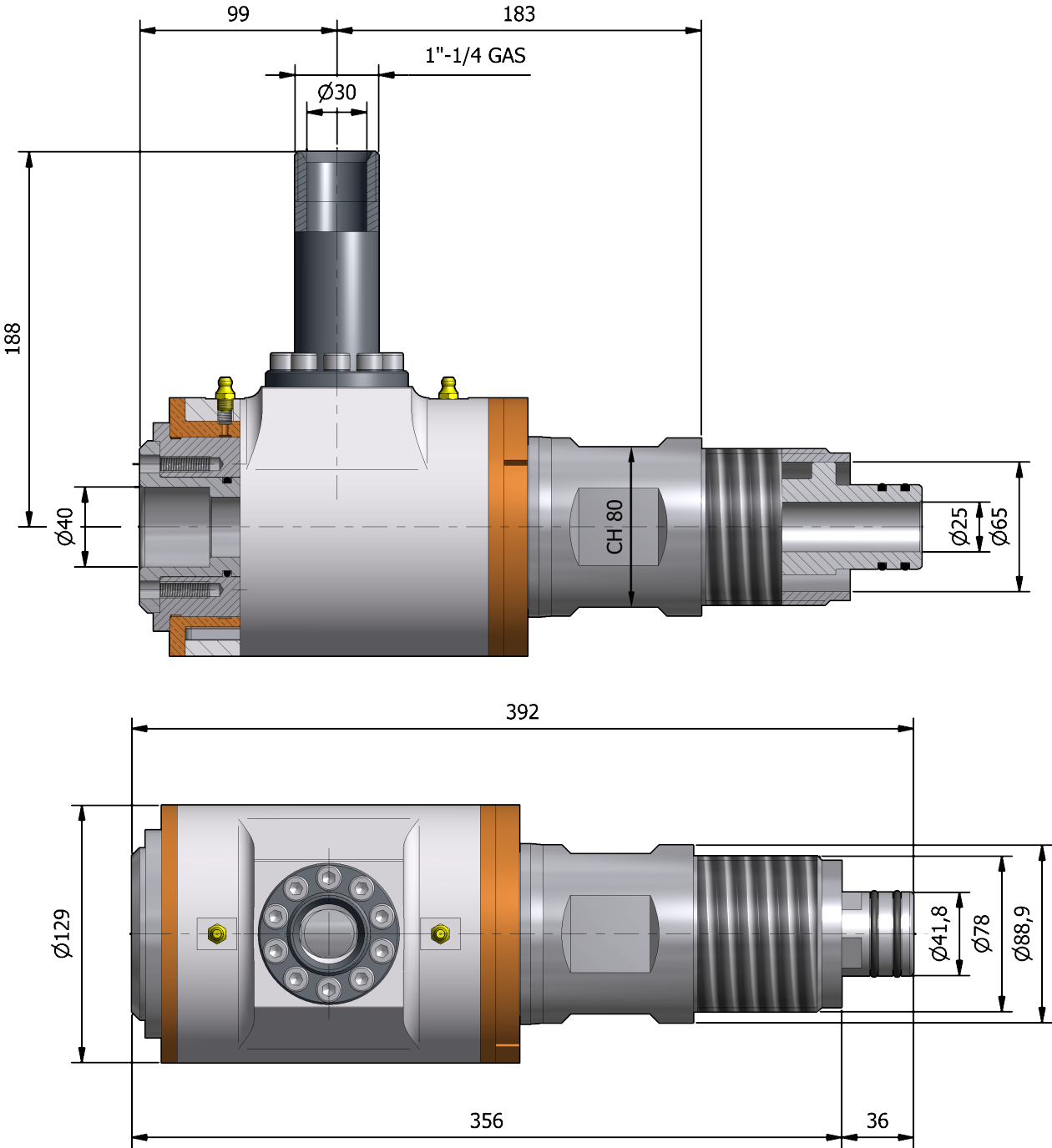
**Washing procedure after jet grouting treatment:**

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

**Maintenance:**

Lubricate the bushings at least every 3h using lithium based grease.

|                                                                                        |                  |
|----------------------------------------------------------------------------------------|------------------|
| CODICE<br>CODE                                                                         | J-8C214550       |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 3 MPa            |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 2,4 MPa          |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C  |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 35 RPM (MAX 2 h) |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 110 RPM          |
| MEDIA<br>MEDIUM                                                                        | AIR              |
| PESO<br>WEIGHT                                                                         | 19 KG            |



## 2.11 UNDER ROTARY L.P. D.90 JET AIR SWIVEL: J-SW914550

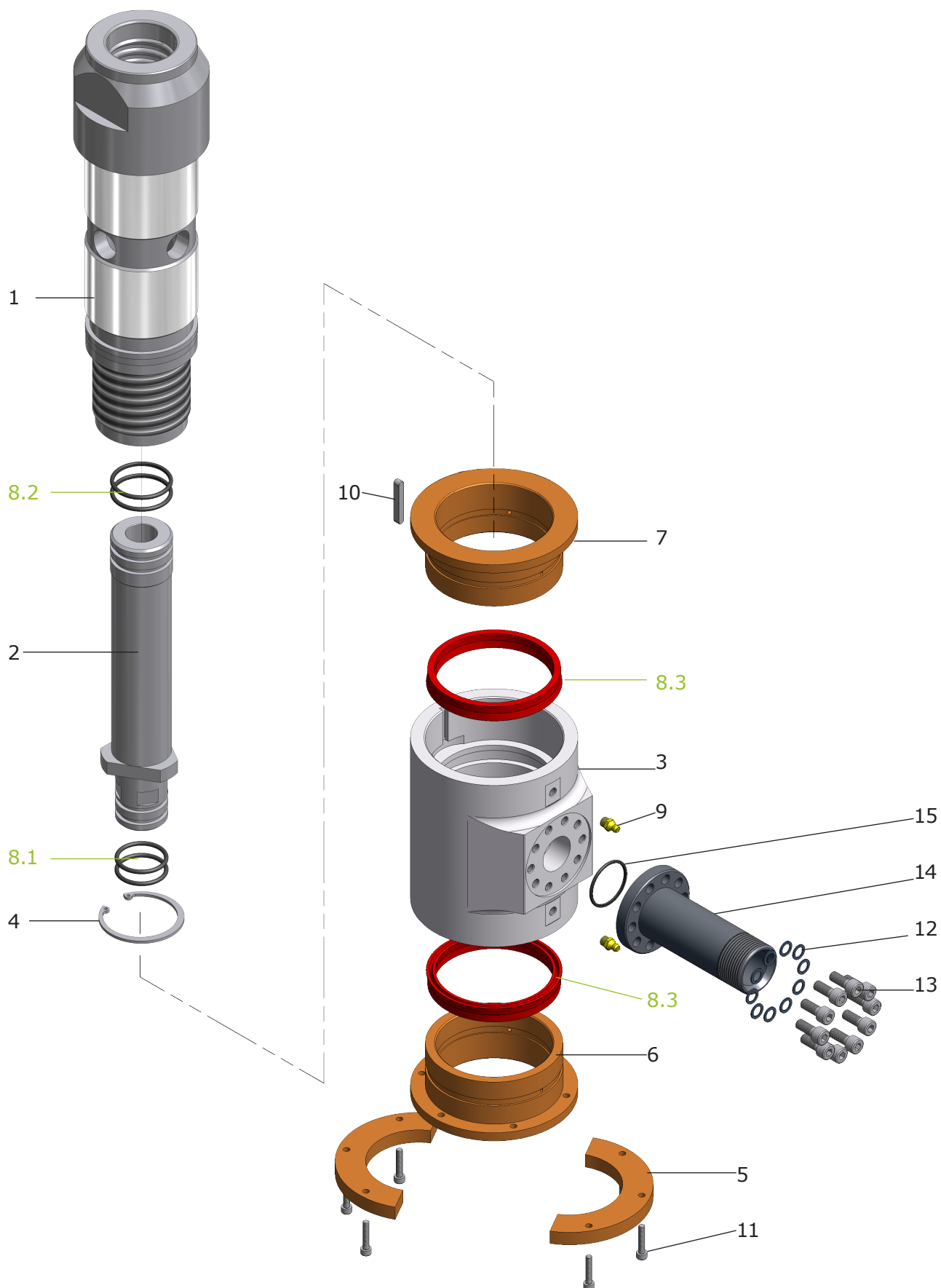
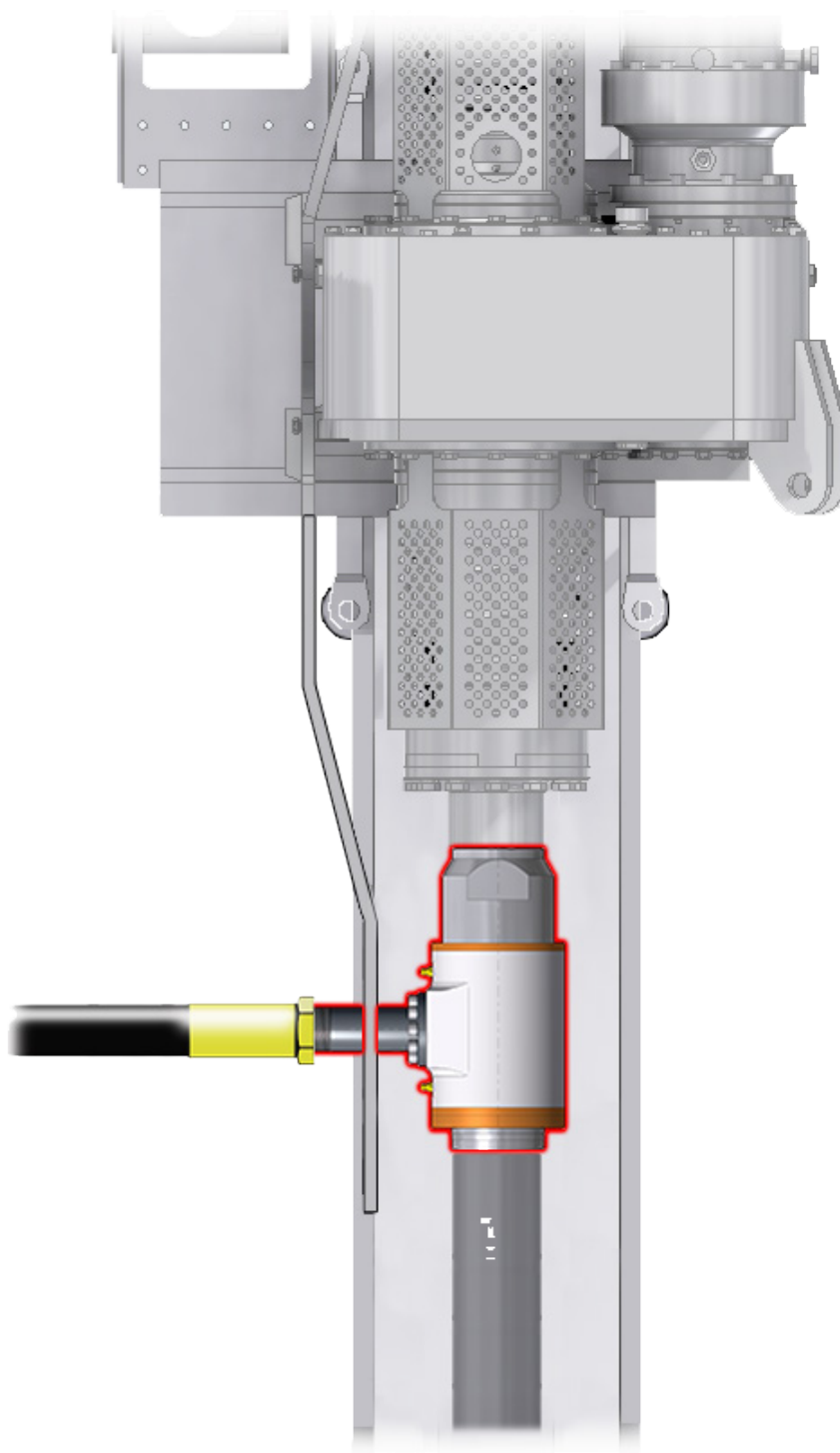


FIG. 2.11

| J-SW914550 (REF. FIG. 2.11) |                    |                                   |                                 |     |      |
|-----------------------------|--------------------|-----------------------------------|---------------------------------|-----|------|
| REF. No.                    | CODICE CODE        | DESCRIZIONE                       | DESCRIPTION                     | QTY | NOTE |
| 1                           | D-1745-1           | ALBERO TESTA B.P. SOTTO TESTA     | L.P. SWIVEL SHAFT C2 TYPE       | 1   |      |
| 2                           | D-1745-2           | ALBERO INT. TESTA B.P. S. TESTA   | L.P. SWIVEL INNER SHAFT C2 TYPE | 1   |      |
| 3                           | J-8C214553         | CORPO TESTA B.P. C2 MAX D. 90     | L.P. SWIVEL BODY C2 TYPE        | 1   |      |
| 4                           | 7437D65S25         | SEEGER X INTERNI 65 MM            | ELASTIC HOLE RING D.65          | 1   |      |
| 5                           | J-8C214507         | BRONZINA 1/2 TESTA B.P.           | HALF BRONZE BUSHING             | 1+1 |      |
| 6                           | J-8C214506         | BRONZINA TESTA B.P.               | BRONZE BUSHING                  | 1   |      |
| 7                           | J-8C214505         | BRONZINA TESTA B.P. SUPERIORE     | UPPER BRONZE BUSHING            | 1   |      |
| 8                           | J-SW914550-K       | KIT GUARNIZ. TESTA ARIA/B.P. S.T. | UNDER ROTARY AIR SW. SEALS KIT  | 1   |      |
| 8.1                         | MR-OR220           | O-RING RIF.POLYPAC 220            | O-RING REF.POLYPAC 220          | 2   | (1)  |
| 8.2                         | MR-OR826           | O-RING RIF. POLYPAC 826           | O-RING REF. POLYPAC 826         | 1   | (1)  |
| 8.3                         | MR-MUP10590        | GUARNIZ. MU/P 105/90 RIF.POLYPAC  | MU/P SEAL 105/90 RIF.POLYPAC    | 2   | (1)  |
| 9                           | 71412AM8P125       | INGRASSATORE M8                   | M8 LUBRICATOR                   | 2   |      |
| 10                          | 6604A6X6X40        | LINGUETTA 6x6x40                  | 6x6x40 PARALLEL KEY             | 1   |      |
| 11                          | 5931M5X25P0888ZB   | VITE TCEI M5x25                   | SOCKET SCREW M5x25              | 6   |      |
| 12                          | SCHNORM8ZB         | RONDELLA SCHNORR D.8              | D.8 SHNORR WASHER               | 10  |      |
| 13                          | 5931M8X20P125129GR | VITE TCEI M8x20 12.9              | SOCKET SCREW M8x20 12.9 UNI5931 | 10  |      |
| 14                          | D-0699-3-4-2       | ATTACCO TESTA ARIA 1"-1/4         | 1"-1/4 AIR INLET                | 1   |      |
| 15                          | MR-OR126           | O-RING 126 RIF POLYPAC            | O-RING 126 REF. POLYPAC         | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

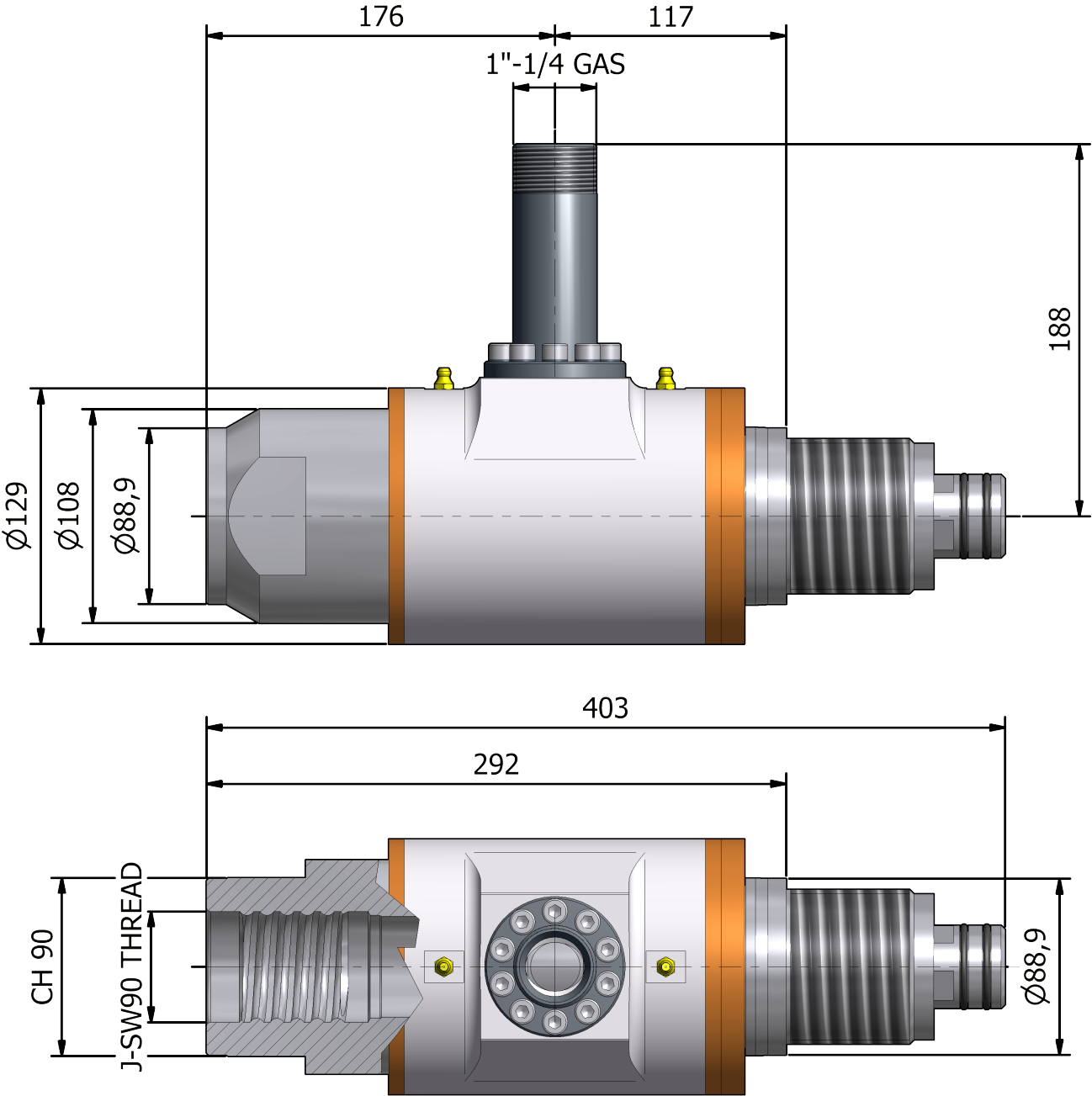
**Washing procedure after jet grouting treatment:**

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

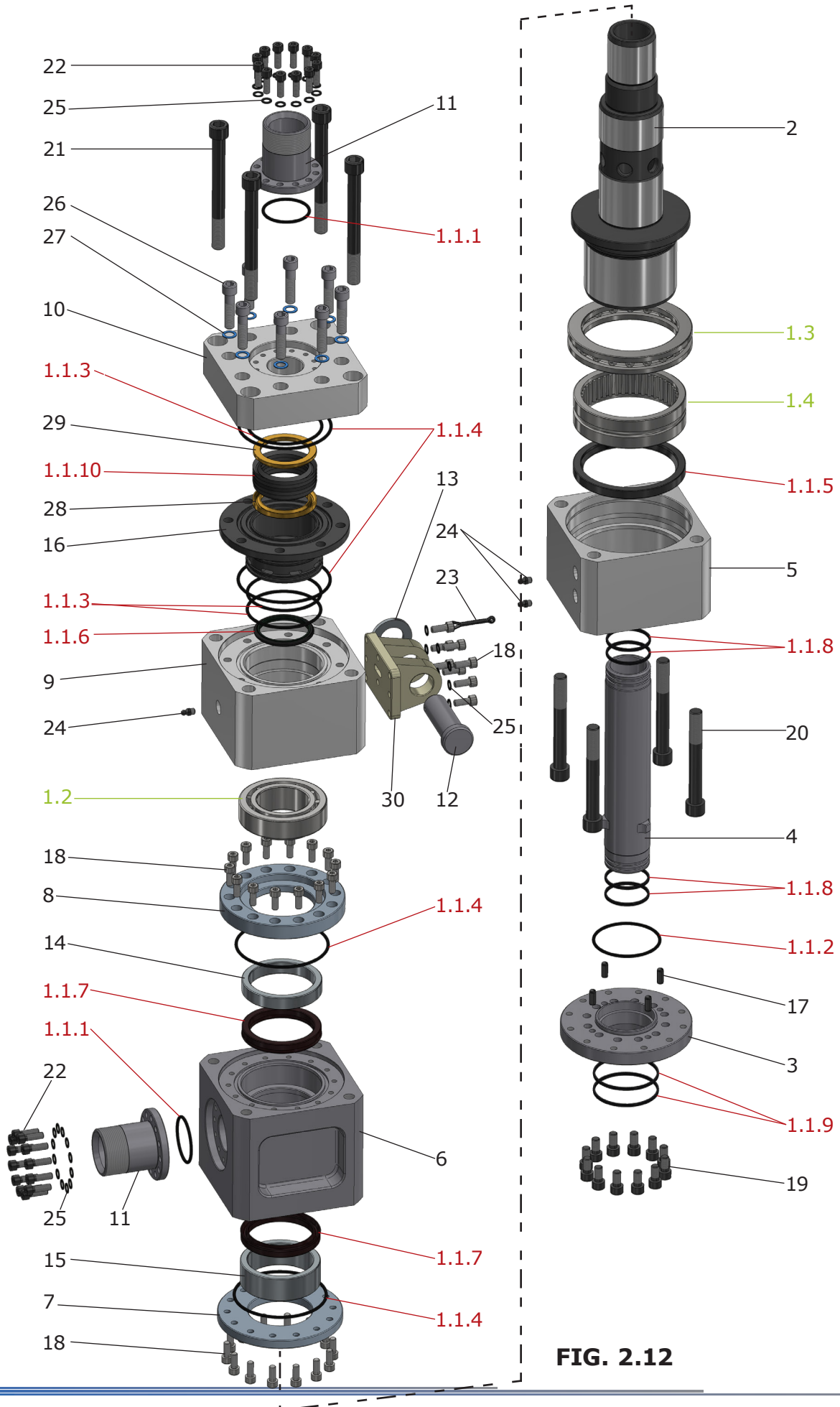
**Maintenance:**

*Lubricate the bushings at least every 3h using lithium based grease.*

|                                                                                        |                  |
|----------------------------------------------------------------------------------------|------------------|
| CODICE<br>CODE                                                                         | J-SW914550       |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 3 MPa            |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 2,4 MPa          |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C  |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 35 RPM (MAX 2 h) |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 110 RPM          |
| MEDIA<br>MEDIUM                                                                        | AIR              |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 15 kNm           |
| PESO<br>WEIGHT                                                                         | 20,5 KG          |



## 2.12 MODULAR H.P. SWIVEL D.45 C2 GROUT-AIR: J-AMHPS4C2





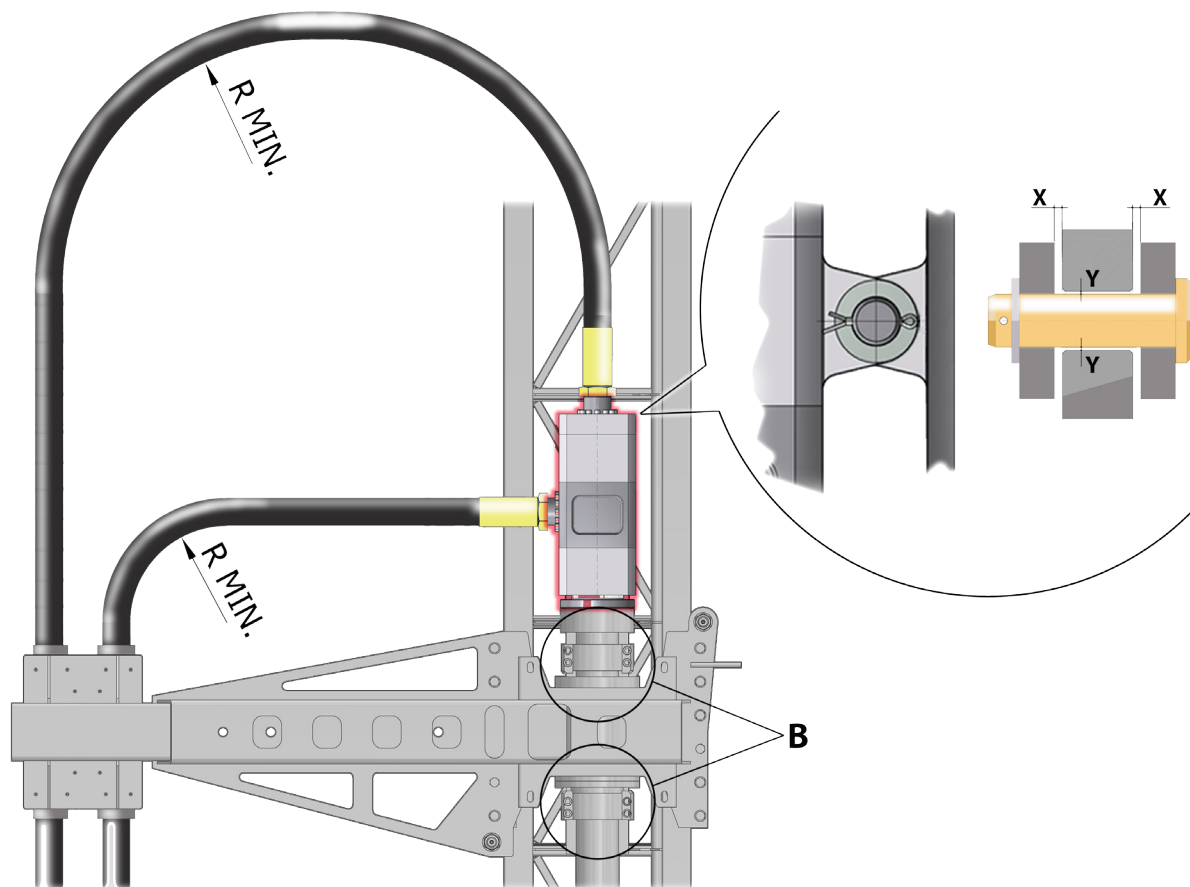


| J-AMHPS4C2 (REF. FIG. 2.12) |                |                                     |                               |     |      |
|-----------------------------|----------------|-------------------------------------|-------------------------------|-----|------|
| REF. No.                    | CODICE CODE    | DESCRIZIONE                         | DESCRIPTION                   | QTY | NOTE |
| 1                           | J-AMHPS4C2-A   | KIT RICAMBI MODULAR SWIVEL C2       | SPARE PARTS KIT MODULAR SW.   | 1   |      |
| 1.1                         | J-AMHPS4C2-B   | KIT GUARNIZIONI MODULAR SWIVEL C2   | SEALS KIT MODULAR SWIVEL C2   | 1   |      |
| 1.1.1                       | MR-OR227       | O-RING 227 RIF POLYPAC              | O-RING 227 REF. POLYPAC       | 2   | (1)  |
| 1.1.2                       | MR-OR235       | O-RING 235 RIF POLYPAC              | O-RING 235 REF. POLYPAC       | 1   | (1)  |
| 1.1.3                       | MR-OR238       | O-RING 238 RIF POLYPAC              | O-RING 238 REF. POLYPAC       | 3   | (1)  |
| 1.1.4                       | MR-OR245       | O-RING 245 RIF. POLYPAC             | O-RING 245 REF. POLYPAC       | 4   | (1)  |
| 1.1.5                       | MR-A115X140X12 | PARAOILIO A 115X140X12 SINGOLO LAB. | ONE LIP SEAL A 115X140X12     | 1   | (1)  |
| 1.1.6                       | MR-IG/R0600    | GUARNIZ. IG/R 0600 RIF. POLYPAC     | IG/R 0600 SEAL REF. POLYPAC   | 1   | (1)  |
| 1.1.7                       | MR-MUP80100    | GUARNIZ. MU/P 80-100 RIF POLYPAC    | MU/P 80-100 SEAL REF. POLYPAC | 2   | (1)  |
| 1.1.8                       | D-1410-A       | K35-P 56X51.5 L=3.5 T-ECOPUR        | K35-P 56X51.5 L=3.5 T-ECOPUR  | 4   | (1)  |
| 1.1.9                       | D-1410-B       | K35-P 82X77.5 L=3.5 T-ECOPUR        | K35-P 82X77.5 L=3.5 T-ECOPUR  | 2   | (1)  |
| 1.1.10                      | KIT-CH314236   | CH314236 (4+1 ELEM.)                | CH314236 SEAL (4+1 RINGS)     | 1   | (1)  |
| 1.2                         | MR-3DE33113    | CUSCINETTO 3DE 65X110X34 ISO355     | 3DE 65X110X34 ISO355 BEARING  | 1   | (1)  |
| 1.3                         | MR-51124       | CUSC. 120X155X25 DIN711             | 120X155X25 DIN711 BEARING     | 1   | (1)  |
| 1.4                         | MR-RNA4920     | RNA4920 115X140X40 DIN617           | RNA4920 115X140X40 DIN617     | 1   | (1)  |
| 2                           | D-1410-1       | ALBERO TESTA MODULARE               | MODULAR SWIVEL SHAFT          | 1   |      |
| 3                           | D-1410-2       | FLANGIA INFERIORE                   | LOWER FLANGE                  | 1   |      |
| 4                           | D-1410-3       | TUBO INTERNO                        | INNER PIPE                    | 1   |      |
| 5                           | D-1410-4       | STADIO N°4 TESTA                    | SWIVEL BODY PART No.4         | 1   |      |
| 6                           | D-1410-5       | STADIO N°3 TESTA                    | SWIVEL BODY PART No.3         | 1   |      |
| 7                           | D-1410-6       | FLANGIA INTERNA INFERIORE           | INNER LOWER FLANGE            | 1   |      |
| 8                           | D-1410-7       | FLANGIA INTERNA SUPERIORE           | INNER UPPER FLANGE            | 1   |      |
| 9                           | D-1410-8       | STADIO N°2 TESTA                    | SWIVEL BODY PART No.2         | 1   |      |
| 10                          | D-1410-9       | STADIO N°1 TESTA                    | SWIVEL BODY PART No.1         | 1   |      |
| 11                          | D-1410-10      | ATTACCO 2" GAS                      | 2" GAS INLET                  | 2   |      |
| 12                          | D-1410-11      | PERNO                               | PIN                           | 1   |      |
| 13                          | D-1410-12      | RONDELLA PER PERNO                  | PIN WASHER                    | 1   |      |
| 14                          | D-1410-13      | DISTANZ. SUP MODULAR C2             | UPPER SPACER                  | 1   |      |
| 15                          | D-1410-14      | DISTANZ. INF MODULAR C2             | LOWER SPACER                  | 1   |      |
| 16                          | D-1410-20-31   | PORTA GUARN. MODULAR SWIVEL         | SEALS HOUSING                 | 1   |      |

J-AMHPS4C2 (REF. FIG. 2.12)

| REF. No. | CODICE CODE         | DESCRIZIONE                         | DESCRIPTION                       | QTY | NOTE |
|----------|---------------------|-------------------------------------|-----------------------------------|-----|------|
| 17       | 8735AD8X20          | SPINA D.8X20-A ISO8735              | D.8X20-A ISO8735 PIN              | 4   |      |
| 18       | 5931M8X20P125129GR  | VITE TCEI M8x20 12.9 UNI 5931       | SOCKET SCREW M8x20 12.9           | 36  |      |
| 19       | 5931M10X20P15129GR  | VITE TCEI M10X20 12.9 UNI 5931      | SOCKET SCREW M10X20 12.9          | 12  |      |
| 20       | 5931M16X130P2129GR  | VITE TCEI M16x130 12.9 UNI 5931     | SOCKET SCREW M16x130 12.9         | 4   |      |
| 21       | 5931M16X160P2129GR  | VITE TCEI M16x160 CL 12.9 UNI 5931  | SOCKET SCREW M16x160 12.9         | 4   |      |
| 22       | 5931M8X25P125129GR  | VITE TCEI M8x25 12.9 UNI5931        | SOCKET SCREW M8x25 12.9           | 24  |      |
| 23       | 1336D5X45ZB         | COPIGLIA UNI1336-5x45               | COTTER PIN UNI1336-5x45           | 1   |      |
| 24       | 71412AM8P125        | INGRASSATORE M8                     | M8 LUBRICATOR                     | 3   |      |
| 25       | SCHNORM8ZB          | RONDELLA SCHNORR D.8                | D.8 SHNORR WASHER                 | 32  |      |
| 26       | 5931M12X50P175129GR | VITE TCEI M12x50 12.9 UNI 5931      | SOCKET SCREW M12x50 12.9          | 8   |      |
| 27       | SCHNORM12ZB         | RONDELLA SCHNORR D.12               | D.12 SHNORR WASHER                | 8   |      |
| 28       | D-1410-20-30        | BASE RING PER CH314236 A 5 ELEM.    | CH314236 X 5 RINGS BASE RING      | 1   |      |
| 29       | D-1410-20-32        | ENERGISER RING PER CH314236 A 5 EL. | CH314236 X 5 RINGS ENERGISER RING | 1   |      |
| 30       | D-1410-8-2          | STAFFA DI ATTACCO                   | ATTACHMENT BRACKET                | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

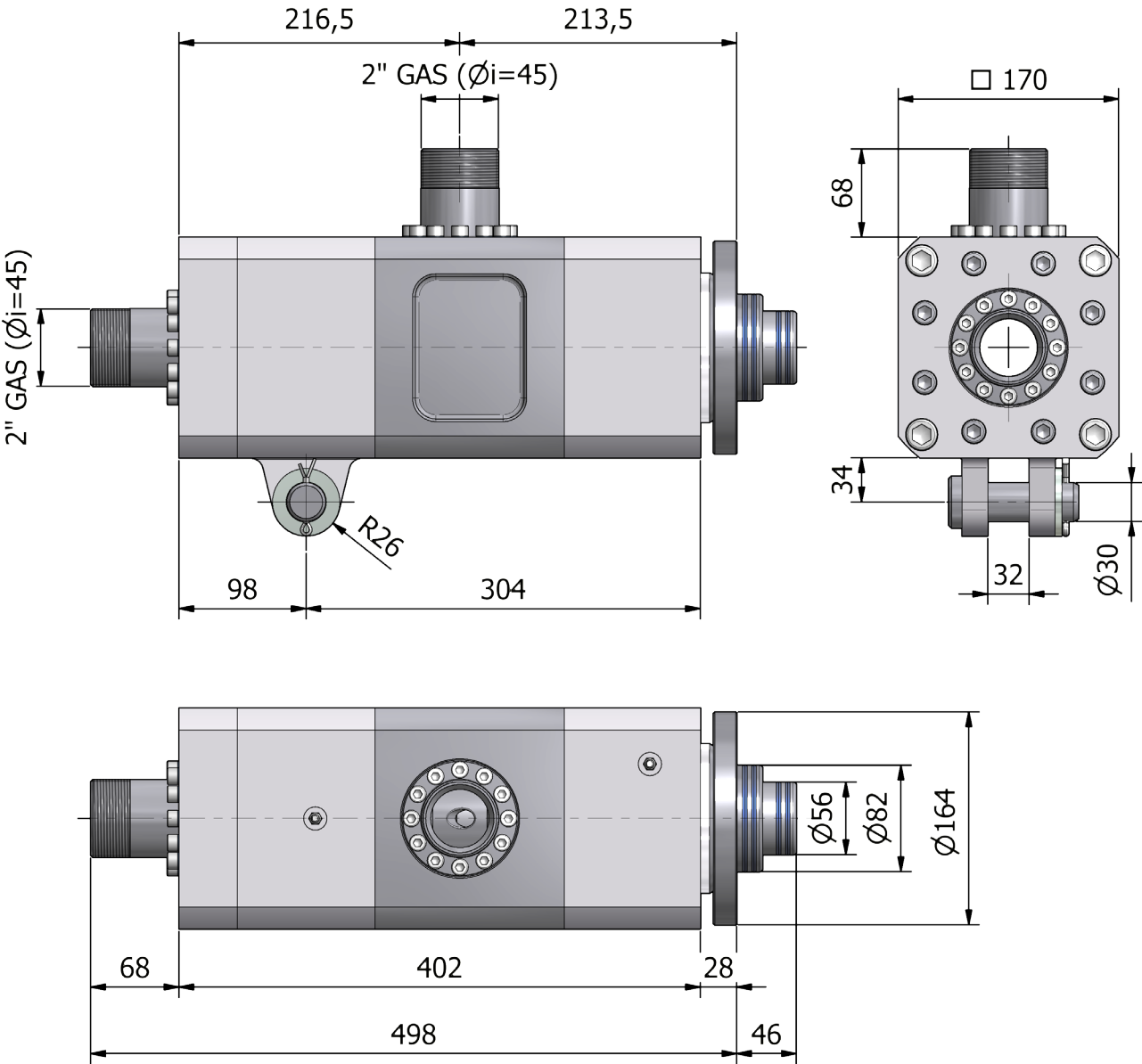
Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                                   |                      |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------|
| CODICE<br>CODE                                                                         | J-AMHPS4C2                                                                                                        |                      |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa (CEMENTO / GROUT)                                                                                          | 3 MPa (ARIA / AIR)   |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)                                                                                          | 2,4 MPa (ARIA / AIR) |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                                   |                      |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                                  |                      |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 85-105 RPM                                                                                                        |                      |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                            |                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 45 KN                                                                                                             |                      |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA<br>(RAPPORTO C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4) | AIR                  |
| PESO<br>WEIGHT                                                                         | 48,7 KG                                                                                                           |                      |



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2.13 L.P. D.114 C2 AIR SWIVEL: J-8C212500

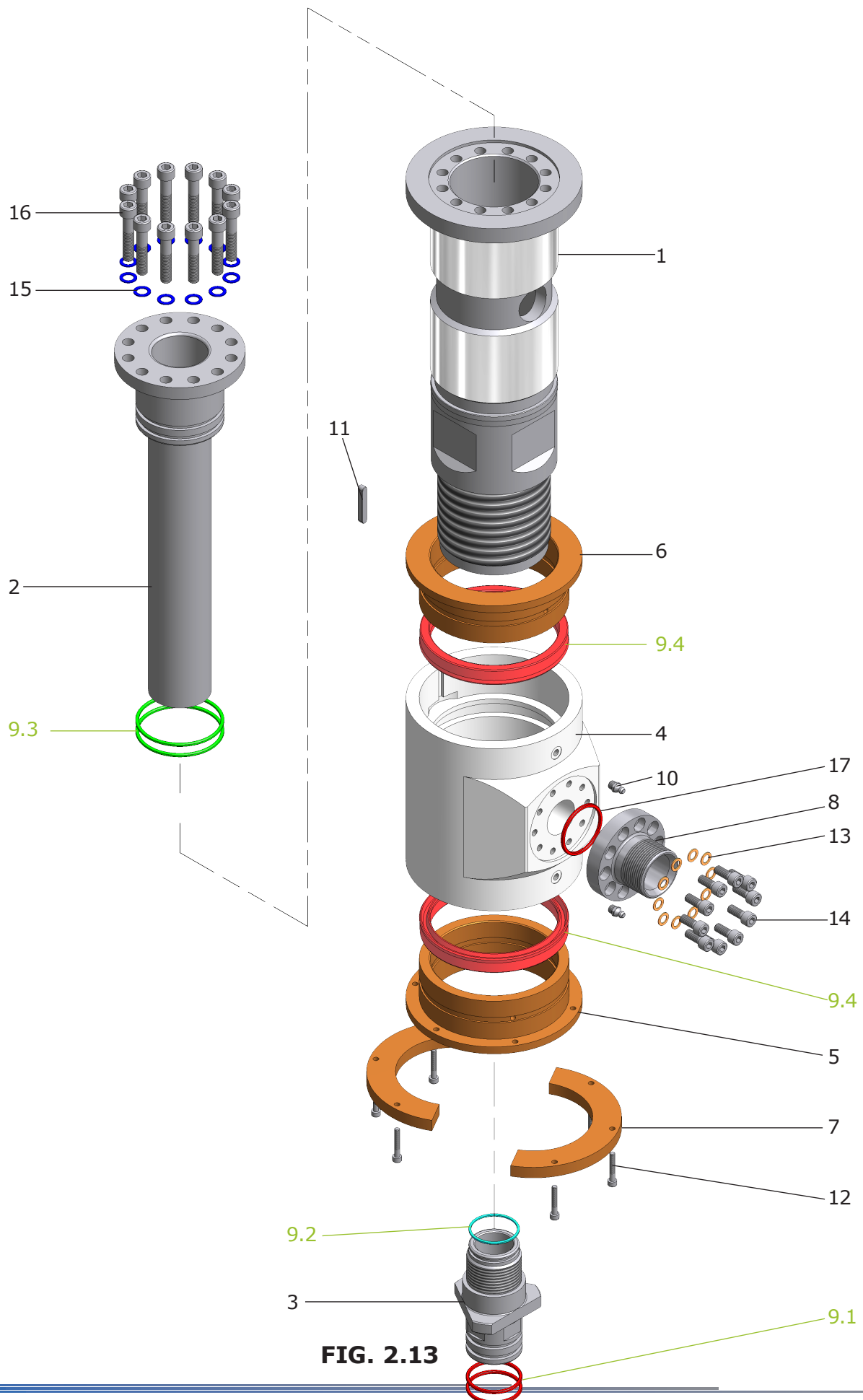
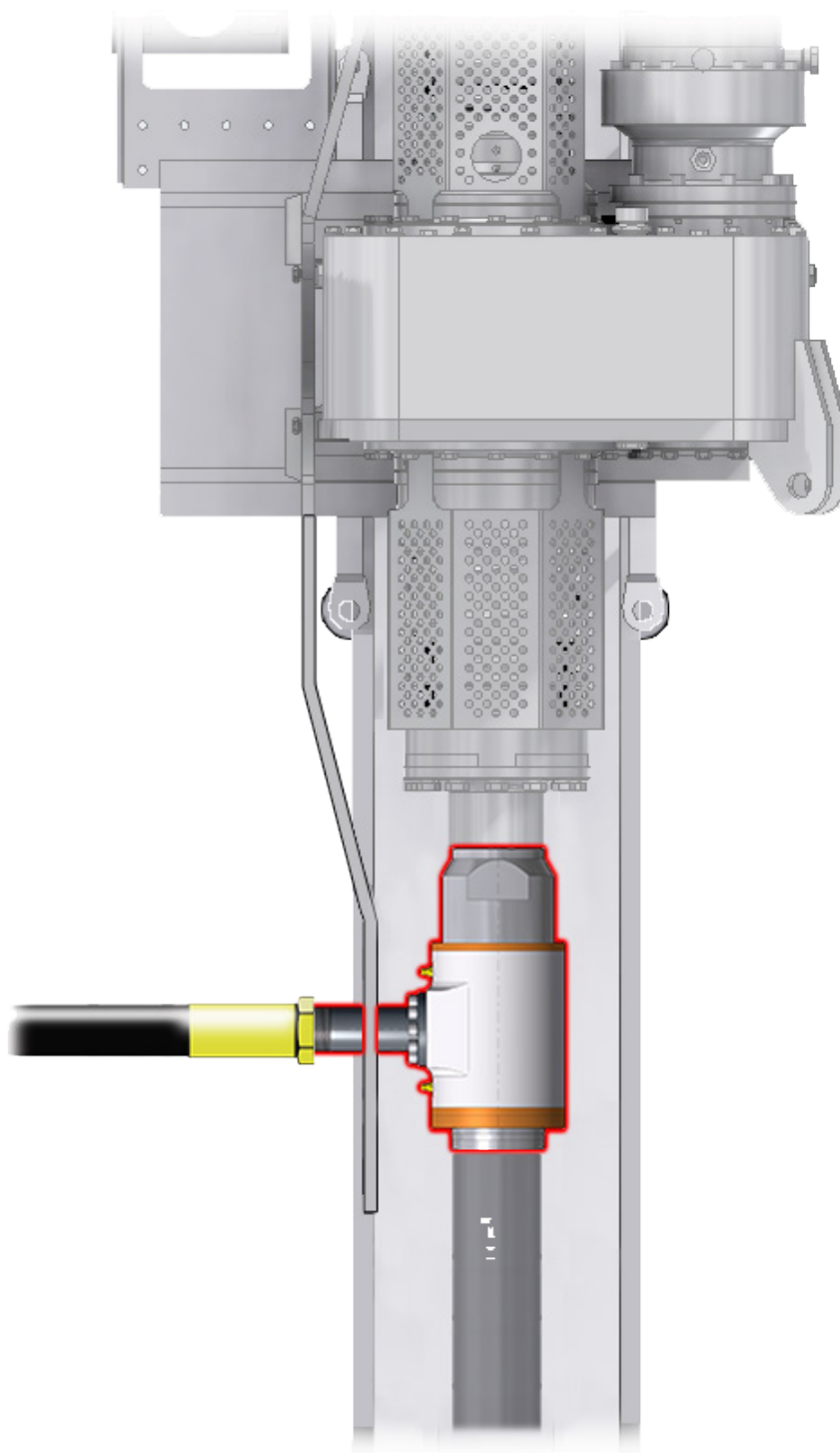


FIG. 2.13

J-8C212500 (REF. FIG. 2.13)

| REF. No. | CODICE CODE        | DESCRIZIONE                        | DESCRIPTION                      | QTY | NOTE |
|----------|--------------------|------------------------------------|----------------------------------|-----|------|
| 1        | J-8C212552         | ALBERO TESTA B.P. C2 D.114 1"-1/2  | L.P. C2 D.114 SWIVEL SHAFT       | 1   |      |
| 2        | J-8C212555         | ALBERO INT. B.P. C2 D.114 1"-1/2   | L.P. C2 D.114 SWIVEL INNER SHAFT | 1   |      |
| 3        | J-8C212513         | MANICOTTO TESTA B.P. D.114 1"-1/2  | L.P. C2 D.114 SWIVEL COUPLING    | 1   |      |
| 4        | D-1089/3           | CORPO EST. B.P. C2 D.114 1"-1/2    | L.P. C2 D.114 SWIVEL BODY        | 1   |      |
| 5        | J-8C212507         | BRONZINA INF. TESTA B.P. D.114     | L.P. SW. LOWER BRONZE BUSHING    | 1   |      |
| 6        | J-8C212506         | BRONZINA SUP. TESTA B.P. D.114     | L.P. SW. UPPER BRONZE BUSHING    | 1   |      |
| 7        | J-8C212505         | 1/2 BRONZINA TESTA B.P. D.114      | L.P. SW. BRONZE HALF BUSHING     | 1   |      |
| 8        | J-8C2TS709         | ATTACCO 1"-1/2 TESTA               | 1"-1/2 INLET                     | 1   |      |
| 9        | J-8C212501         | KIT GUARNIZ. TESTA ARIA/B.P. C2    | L.P. C2 D.114 SWIVEL SEALS KIT   | 1   |      |
| 9.1      | MR-OR827           | O-RING RIF POLYPAC 827             | O-RING REF. POLYPAC 827          | 3   | (1)  |
| 9.2      | MR-OR130           | O-RING 130 RIF POLYPAC             | O-RING 130 REF. POLYPAC          | 1   | (1)  |
| 9.3      | MR-OR845           | O-RING RIF POLYPAC 845             | O-RING REF. POLYPAC 845          | 2   | (1)  |
| 9.4      | MR-MUP115135       | GUARNIZ. MU/P 115-135 RIF. POLYPAC | MU/P 115-135 SEAL REF. POLYPAC   | 2   | (1)  |
| 10       | 71412AM8P125       | INGRASSATORE M8                    | M8 LUBRICATOR                    | 2   |      |
| 11       | 6604A6X6X40        | LINGUETTA 6x6x40                   | 6x6x40 PARALLEL KEY              | 1   |      |
| 12       | 5931M5X30P08129GR  | VITE TCEI M5x30 12.9 UNI 5931      | SOCKET SCREW M5x30 12.9          | 6   |      |
| 13       | SCHNORM8ZB         | RONDELLA SCHNORR D.8               | SCHNORR D.8 WASHER               | 10  |      |
| 14       | 5931M8X20P125129GR | VITE TCEI M8x20 12.9 UNI 5931      | SOCKET SCREW M8x20 12.9          | 10  |      |
| 15       | SCHNORM10ZB        | RONDELLA SCHNORR D.10              | SCHNORR D.10 WASHER              | 12  |      |
| 16       | 5931M10X50P15129GR | VITE TCEI M10x50 12.9 UNI 5931     | SOCKET SCREW M10x50 12.9         | 12  |      |
| 17       | MR-OR827           | O-RING RIF. POLYPAC 827            | O-RING REF. POLYPAC 827          | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

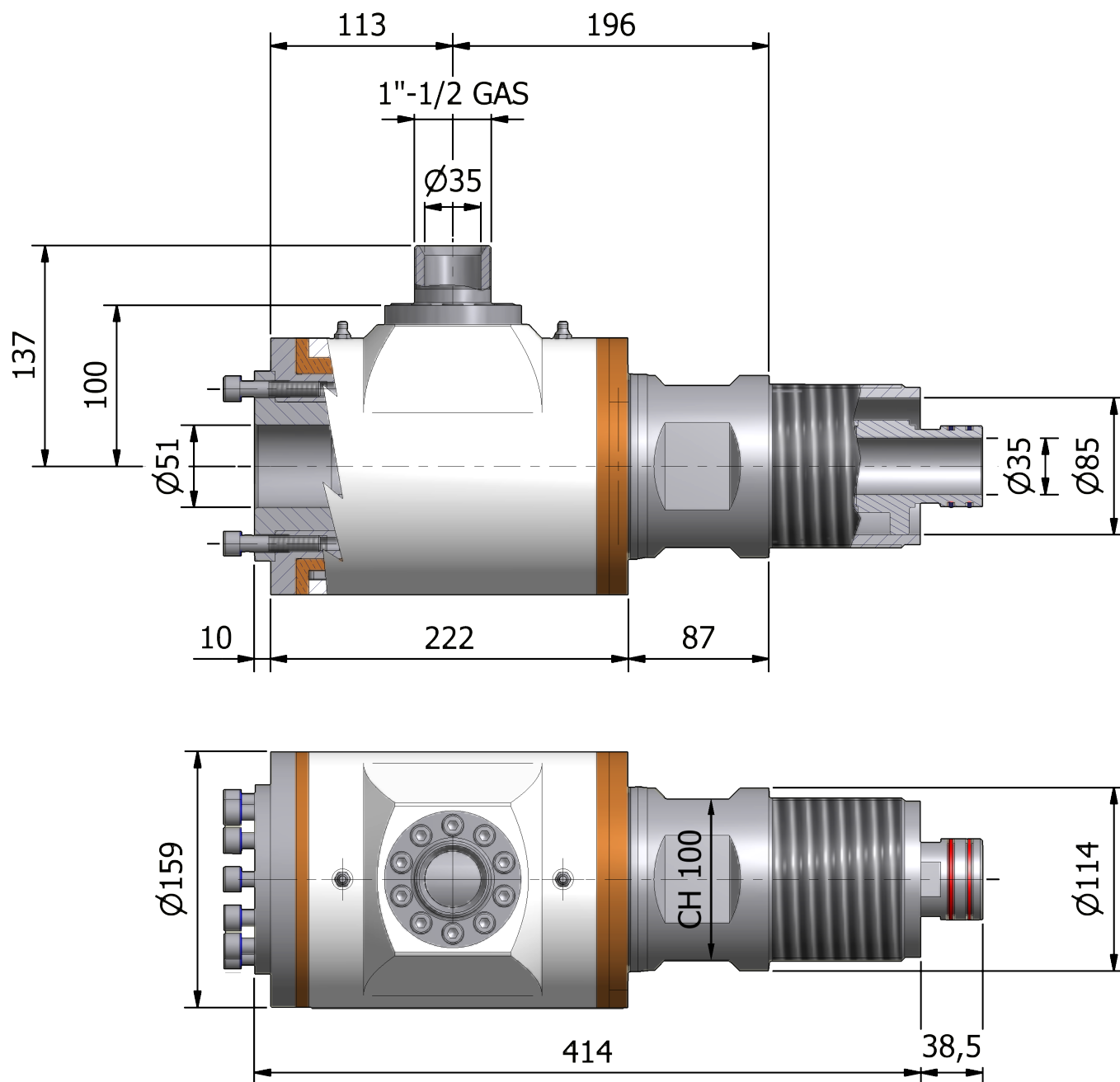
**Washing procedure after jet grouting treatment:**

*Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.*

**Maintenance:**

*Lubricate the bushings at least every 3h using lithium based grease.*





2.14 D.114 J2 SWIVEL J-AMHPS4J2 (GROUT-AIR) [J-WMHPS4J2 (GROUT-WATER)]

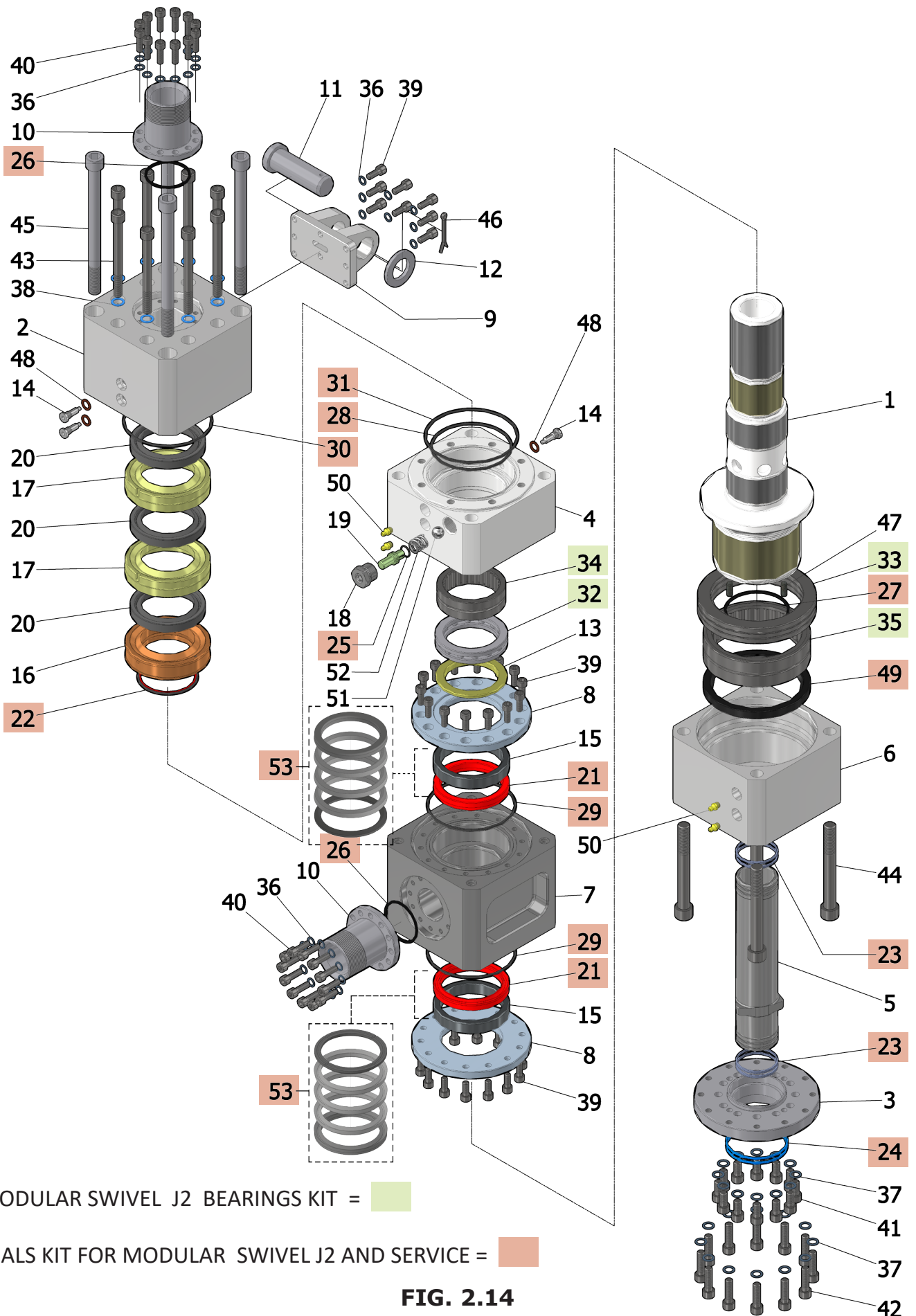


FIG. 2.14



J-AMHPS4J2 (GROUT-AIR) [J-WMHPS4J2 (GROUT-WATER)] (REF. FIG. 2.14)

| REF. No. | CODICE CODE           | DESCRIZIONE                             | DESCRIPTION                            | QTY | NOTE |
|----------|-----------------------|-----------------------------------------|----------------------------------------|-----|------|
| 1        | 1410K-1               | ALBERO MODULAR HP SWIVEL C2 KALSI SEALS | MODULAR HP SWIVEL C2 KALSI SEALS SHAFT | 1   |      |
| 2        | 1410J2-2              | STADIO N°1 TIPO F                       | SWIVEL BODY N.1 TYPE F                 | 1   |      |
| 3        | 1410-2                | FLANGIA INFERIORE                       | LOWER FLANGE                           | 1   |      |
| 4        | 1410J2-3              | STADIO N°2 TIPO F                       | SWIVEL BODY N.2 TYPE F                 | 1   |      |
| 5        | 1410K-3               | TUBO INTERNO                            | INNER PIPE                             | 1   |      |
| 6        | 1410-4                | STADIO N°4                              | SWIVEL BODY N.4                        | 1   |      |
| 7        | 1410-5B               | STADIO N°3                              | SWIVEL BODY N.3                        | 1   |      |
| 8        | 1410-6B               | FLANGIA INTERNA                         | INNER FLANGE                           | 2   |      |
| 9        | 1410-8-2              | STAFFA DI ATTACCO                       | ATTACHMENT BRACKET                     | 1   |      |
| 10       | 1410-10               | ATTACCO 2" GAS                          | 2" GAS INLET                           | 2   |      |
| 11       | 1410-11               | PERNO                                   | PIN                                    | 1   |      |
| 12       | 1410-12               | RONDELLA PER PERNO                      | PIN WASHER                             | 1   |      |
| 13       | 1410F-15              | ANELLO BATTUTA CUSCINETTO ANTERIORE     | FRONT BEARING SPACER                   | 1   |      |
| 14       | 1410-20K-4            | PERNO ANTIGIRO                          | ANTI-SPIN PIN                          | 3   |      |
| 15       | 1410-13               | DISTANZIALE SUPERIORE                   | UPPER SPACER                           | 2   | (2)  |
| 16       | 602-32H               | ANELLO POST. PER GUARNIZ. 602-25        | 602-25 SEAL BACK RING                  | 1   |      |
| 17       | 602-32                | DISTANZIALE PER GUARNIZ. 602-25         | 602-25 SEAL SPACER                     | 2   |      |
| 20       | 602-25                | GUARNIZIONE 602-25 d.2,75"              | SEAL 602-25 d.2,75"                    | 3   |      |
| 18       | 1410J2-20             | GHIERA PER SPIA CEMENTO                 | SAFETY PORT NUT                        | 1   |      |
| 19       | 1410J2-21             | SPIA CEMENTO                            | SAFETY PORT BODY                       | 1   |      |
| 36       | RONDELLA SHNORR M8    | RONDELLA DI SICUREZZA                   | SAFETY WASHER                          | 32  |      |
| 37       | RONDELLA SHNORR M10   | RONDELLA DI SICUREZZA                   | SAFETY WASHER                          | 24  |      |
| 38       | RONDELLA SHNORR M12   | RONDELLA DI SICUREZZA                   | SAFETY WASHER                          | 8   |      |
| 39       | UNI 5931 - M 8 x 20   | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 36  |      |
| 40       | UNI 5931 - M 8 x 25   | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 24  |      |
| 41       | UNI 5931 - M 10 x 20  | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 12  |      |
| 42       | UNI 5931 - M 10 x 35  | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 12  |      |
| 43       | UNI 5931 - M 12 x 120 | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 8   |      |
| 44       | UNI 5931 - M 16 x 130 | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 4   |      |
| 45       | UNI 5931 - M 16 x 200 | VITE TCCE CL.12.9                       | CL. 12.9 SOCKET HEAD SCREW             | 4   |      |
| 46       | UNI 1336 - 5 x 45     | COPIGLIA                                | COTTER PIN                             | 1   |      |



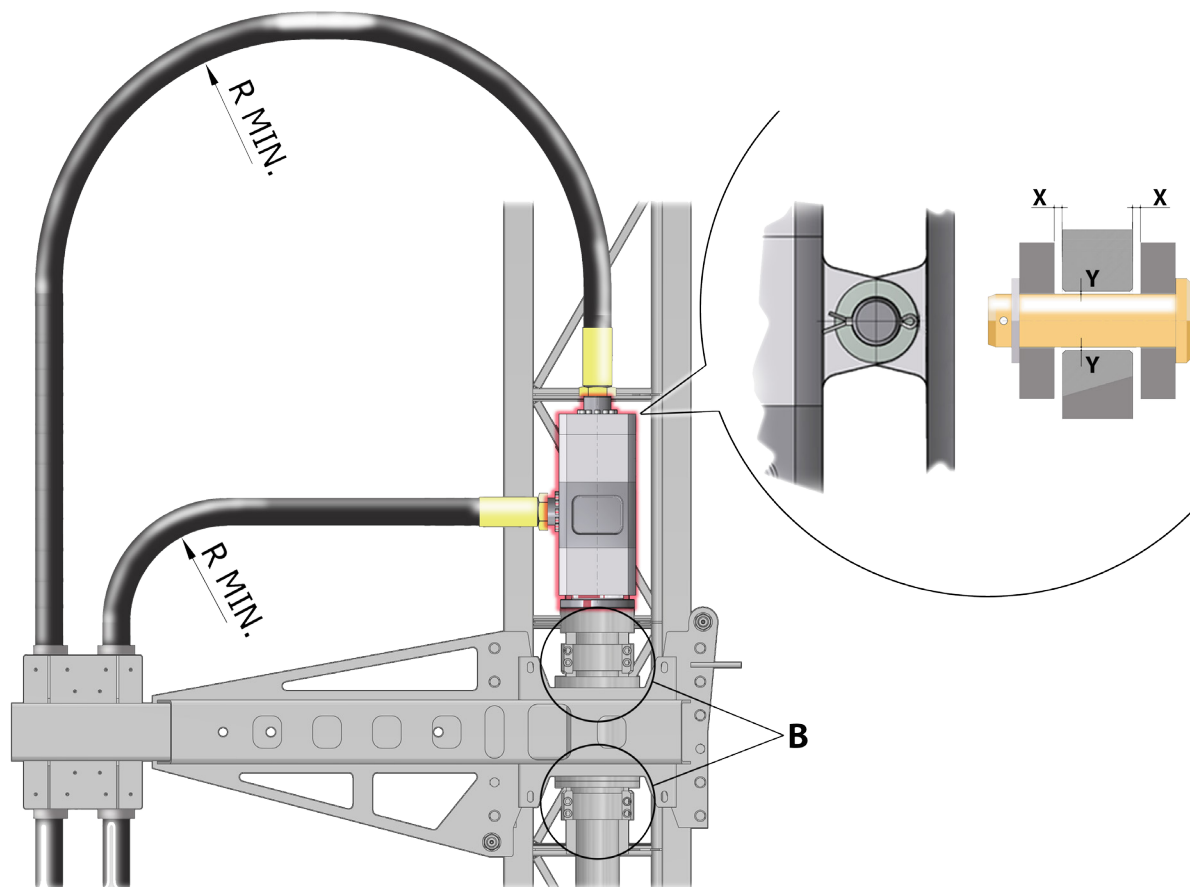
J-AMHPS4J2 (GROUT-AIR) [J-WMHP4J2 (GROUT-WATER)] (REF. FIG. 2.14)

| REF. No. | CODICE CODE                             | DESCRIZIONE                                               | DESCRIPTION                                                | QTY | NOTE   |
|----------|-----------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|-----|--------|
| 47       | ISO 8735 - 8 x 20 - A                   | SPINA CILINDRICA                                          | PIN                                                        | 4   |        |
| 48       | J-CU18                                  | GUARNIZIONE RAME 1/8"                                     | 1/8" COPPER WASHER                                         | 3   |        |
| 50       | 71412AM8P125                            | INGRASSATORE M8                                           | M8 LUBRICATOR                                              | 4   |        |
| 51       | SFERA ACCIAIO AL CROMO D.16 (SKF RB-16) | SFERA SKF ACCIAIO AL CROMO 62-65 HRC                      | STEEL BALL                                                 | 1   |        |
| 52       | J00TP206                                | MOLLA 70 BAR Do=18.8 Di=12 d=3.4 Lo=27 54SiCr6 DIN17223/2 | SPRING 70 BAR Do=18.8 Di=12 d=3.4 Lo=27 54SiCr6 DIN17223/2 | 1   |        |
| -        | J-AMHPS4J2-A                            | KIT CUSCINETTI MODULAR SW. J2                             | MODULAR SW. J2 BEARINGS KIT                                | 1   |        |
| 32       | 51114                                   | CUSCINETTO REGGISPINTE 70x95x18                           | THRUST BEARING 70x95x18                                    | 1   | (1)    |
| 33       | 51124                                   | CUSCINETTO REGGISPINTE 120x155x25                         | THRUST BEARING 120x155x25                                  | 1   | (1)    |
| 34       | NKS 70                                  | CUSCINETTO A RULLINI 70x90x28                             | ROLLER BEARING 70x90x28                                    | 1   | (1)    |
| 35       | RNA 4920 115x140x40                     | CUSCINETTO A RULLINI 115x140x40                           | ROLLER BEARING 115x140x40                                  | 1   | (1)    |
| -        | J-AMHPS4J2-B                            | KIT GUARNIZ. MODULAR SWIVEL J2 ARIA E SERVICE             | SEALS KIT FOR MODULAR SWIVEL J2 AIR AND SERVICE            | 1   |        |
| -        | J-WMHP4J2-B                             | KIT GUARNIZ. MODULAR SWIVEL J2 ACQUA E SERVICE            | SEALS KIT FOR MODULAR SWIVEL J2 WATER AND SERVICE          | 1   |        |
| 21       | MUP 10080                               | GUARNIZ. A LABBRO MUP 100x80x13                           | LIP SEAL MUP 100x80x13                                     | 2   | (1)(2) |
| 22       | XRB-70x81x4.2                           | GUARNIZ. PER STELO ROTANTE                                | ROTARY SEAL                                                | 1   | (1)    |
| 23       | K35-P 56x51.5x3.5 (D-1410-A)            | GUARNIZIONE POLIURETANO                                   | POLIURETHANE SEAL                                          | 4   | (1)    |
| 24       | K35P 82x77.5x3.5                        | GUARNIZIONE POLIURETANO                                   | POLIURETHANE SEAL                                          | 2   | (1)    |
| 25       | OR 014                                  | O-RING                                                    | O-RING SEAL                                                | 1   | (1)    |
| 26       | OR 227                                  | O-RING                                                    | O-RING SEAL                                                | 2   | (1)    |
| 27       | OR 235                                  | O-RING                                                    | O-RING SEAL                                                | 1   | (1)    |
| 28       | OR 242                                  | O-RING                                                    | O-RING SEAL                                                | 1   | (1)    |
| 29       | OR 245                                  | O-RING                                                    | O-RING SEAL                                                | 2   | (1)    |
| 30       | OR 246                                  | O-RING                                                    | O-RING SEAL                                                | 1   | (1)    |
| 31       | OR 247                                  | O-RING                                                    | O-RING SEAL                                                | 1   | (1)    |
| 49       | MR-A115x140x12                          | PARAOLIO SINGOLO LABBRO                                   | LIP SEAL                                                   | 1   | (1)    |
| 53       | MR-CH393314                             | GUARNIZIONE CH 80x100x30                                  | CH SEAL 80x100x30                                          | 2   | (1)(3) |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

(2) NON USATO PER SWIVEL CEMENTO-ACQUA J-WMHP4J2 - NOT USED FOR GROUT-WATER SWIVEL J-WMHP4J2

(3) NON USATO PER SWIVEL CEMENTO-ARIA J-AMHPS4J2 - NOT USED FOR GROUT-AIR SWIVEL J-AMHPS4J2



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 8h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

Lubricate the roller bearings at least every 8h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

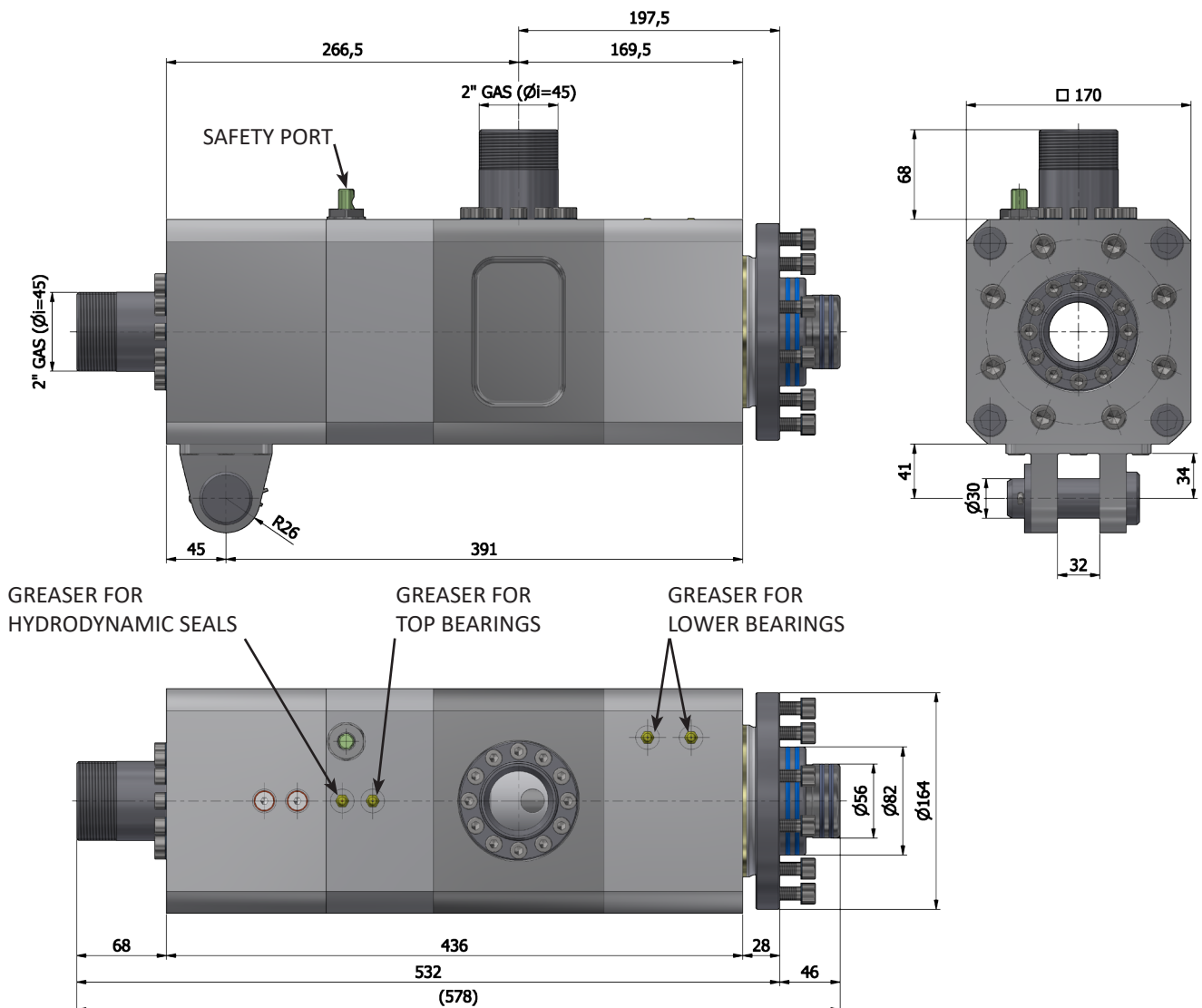
### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

| CODICE<br>CODE                                                                         | J-AMHPS4J2                                                                                                                      | J-WMHPS4J2                                           |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa (CEMENTO / GROUT)<br>3 MPa (ARIA / AIR)                                                                                  | 42 MPa (CEMENTO / GROUT)<br>42 MPa (ACQUA / WATER)   |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>2,4 MPa (ARIA / AIR)                                                                                | 40 MPa (CEMENTO / GROUT)<br>40 MPa (ACQUA / WATER)   |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                                 | -30°C / +120 °C                                      |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                                                |                                                      |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 150 RPM (*)                                                                                                                     |                                                      |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                                          |                                                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 39 KN                                                                                                                           |                                                      |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET: ACQUA E MISCELE<br>CEMENTO-ACQUA (RAPPORTO C:A<br>NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4) | 2ND INLET:<br>AIR (J-AMHPS4J2)<br>WATER (J-WMHPS4J2) |
| PESO<br>WEIGHT                                                                         | 58,7 KG                                                                                                                         |                                                      |

(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals



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## 2.15 SWIVEL C2 RP C64 DX: J-SWC20C64

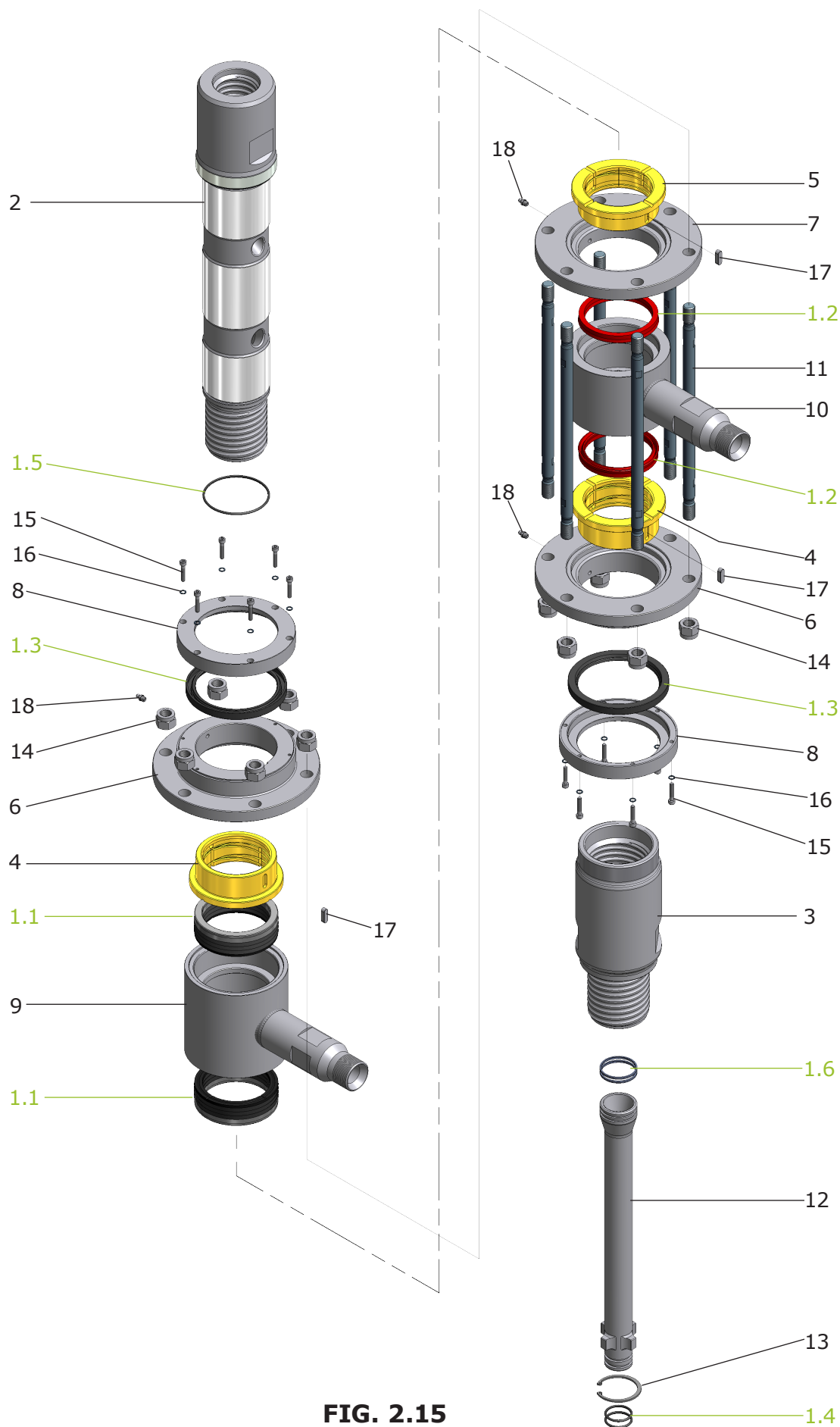
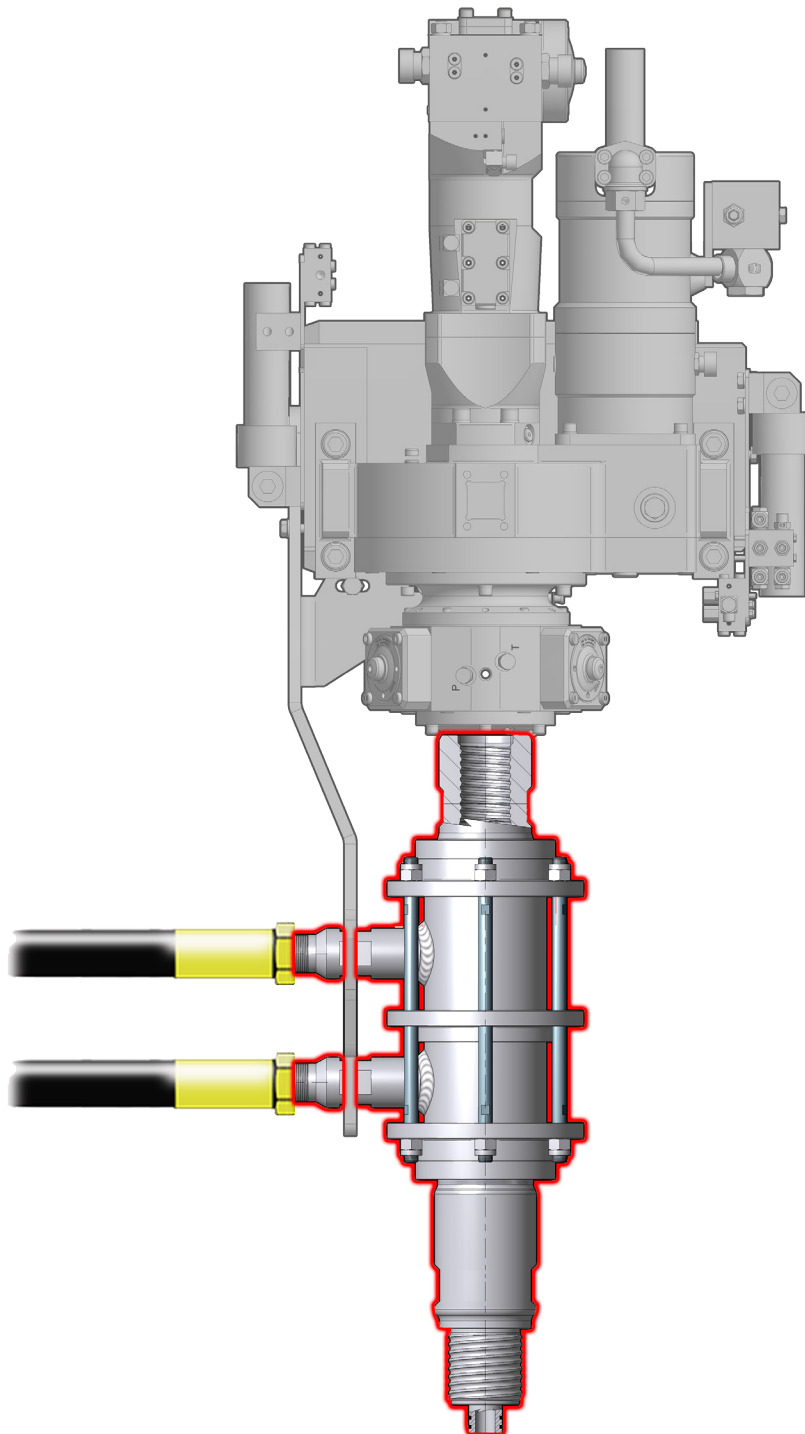


FIG. 2.15



| J-SWC20C64 (REF. FIG. 2.15) |                |                                     |                                   |     |      |
|-----------------------------|----------------|-------------------------------------|-----------------------------------|-----|------|
| REF. No.                    | CODICE CODE    | DESCRIZIONE                         | DESCRIPTION                       | QTY | NOTE |
| 1                           | J-SWC20C64-A   | KIT GUARNIZ. SWIVEL C2 RP JET       | C2 RP JET SWIVEL SEALS KIT        | 1   |      |
| 1.1                         | MR-CH492393    | GUARN. CH492393 RIF POLYPAC         | CH492393 SEAL REF POLYPAC         | 2   | (1)  |
| 1.2                         | MR-MUP100120   | GUARNIZ. MU/P 100-120 RIF POLYPAC   | MU/P 100-120 SEAL REF POLYPAC     | 2   | (1)  |
| 1.3                         | MR-A120X150X12 | PARAOILIO A 120X150X12 SINGOLO LAB. | LIP SEAL 120X150X12               | 2   | (1)  |
| 1.4                         | MR-OR220       | O-RING RIF.POLIPAC 220              | O-RING REF.POLIPAC 220            | 2   | (1)  |
| 1.5                         | MR-OR239       | O-RING RIF.POLIPAC 239              | O-RING REF.POLIPAC 239            | 1   | (1)  |
| 1.6                         | D-1410-A       | K35-P 56X51.5 L=3.5 T-ECOPUR        | K35-P 56X51.5 L=3.5 T-ECOPUR SEAL | 2   | (1)  |
| 2                           | D-1571-6-1     | ALBERO TESTA RP C2                  | C2 RP JET SWIVEL SHAFT            | 1   |      |
| 3                           | D-1571-6-2     | RID. TESTA C2 RP F/M C2 RP JET      | C2 RP SW. F/M C2 RP JET ADAPTER   | 1   |      |
| 4                           | D-1571-6-3     | BRONZINA TESTA C2 RP ESTERNA        | C2 RP SW. EXT. BRONZE BUSHING     | 2   |      |
| 5                           | D-1571-6-4     | BRONZINA TESTA C2 RP INTERMEDIA     | C2 RP SW. MID. BRONZE BUSHING     | 1   |      |
| 6                           | D-1571-6-5     | FLANGIA TESTA C2 RP                 | C2 RP SW. FLANGE                  | 2   |      |
| 7                           | D-1571-6-6     | FLANGIA INTERMEDIA TESTA C2 RP      | C2 RP SW. MIDDLE FLANGE           | 1   |      |
| 8                           | D-1571-6-10    | FLANGIA PARAOILIO TESTA C2 RP       | C2 RP SW. LIP SEAL FLANGE         | 2   |      |
| 9                           | D-1571-6-11    | CORPO SUP. TESTA C2 RP              | C2 RP SW. UPPER BODY              | 1   |      |
| 10                          | D-1571-6-12    | CORPO INF. TESTA C2 RP              | C2 RP SW. LOWER BODY              | 1   |      |
| 11                          | D-1571-6-13    | TIRANTE TESTA C2 RP                 | C2 RP SWIVEL BODY SCREW           | 6   |      |
| 12                          | D-1571-6-14    | MANICOTTO INT. TESTA C2 RP          | C2 RP SW. INNER COUPLING          | 1   |      |
| 13                          | 7438D65S3      | SEEGER X INTERNI 65X3 UNI 7438      | UNI 7438 D.65 ELASTIC RING        | 1   |      |
| 14                          | 7473M18P156SZB | DADO UNI 7473 M18x1.5               | UNI 7473 M18x1.5 LOCKNUT          | 12  |      |
| 15                          | MR-TCEI6X30    | VITE TCEI M6x30 CL.12.9             | SOCKET HEAD SCREW M6x30 12.9      | 12  |      |
| 16                          | SCHNORM6ZB     | RONDELLA SHNORR M6                  | M6 SHNORR WASHER                  | 12  |      |
| 17                          | 6604A8X7X25    | LINGUETTA 8x7x25                    | PARALLEL KEY 8x7x25               | 3   |      |
| 18                          | 71412AM8P125   | INGRASSATORE M8                     | M8 LUBRICATOR                     | 3   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

**Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

**Manutenzione:**

Ingrassare le bronzine almeno ogni 3h con grasso a base di litio.

**Washing procedure after jet grouting treatment:**

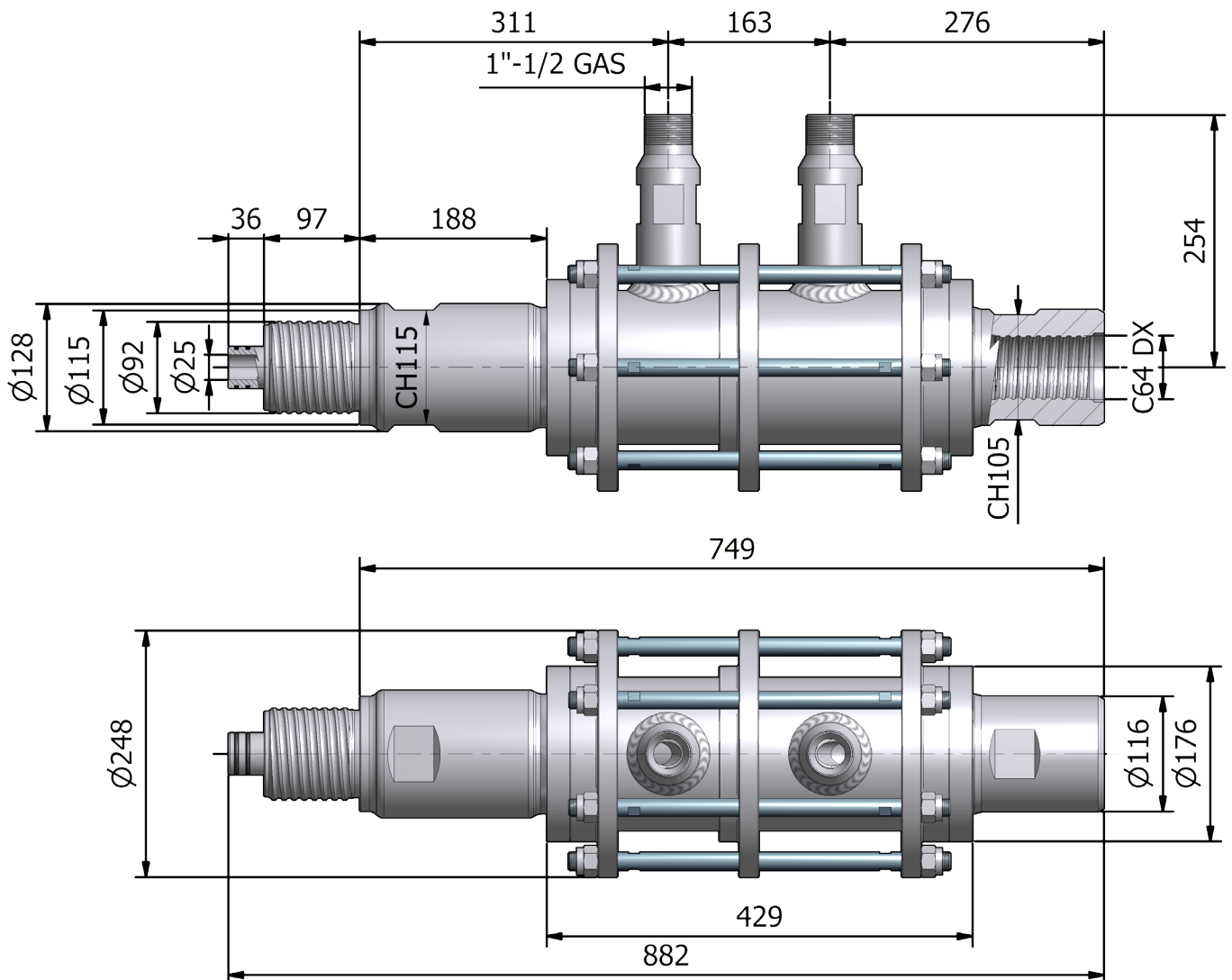
Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

**Maintenance:**

Lubricate the bushings at least every 3h using lithium based grease.

|                                                                                        |                                                                                                                                 |                |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------|
| CODICE<br>CODE                                                                         | J-SWC20C64                                                                                                                      |                |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa (CEMENTO / GROUT)<br>3 MPa (ARIA / AIR)                                                                                  |                |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>2,4 MPa (ARIA / AIR)                                                                                |                |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                                 |                |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                                                |                |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 40 RPM (*)                                                                                                                      |                |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                                          |                |
| COPPIA MASSIMA APPLICABILE<br>MAX TORQUE                                               | 25 kNm                                                                                                                          |                |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET: ACQUA E MISCELE<br>CEMENTO-ACQUA (RAPPORTO C:A<br>NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4) | 2ND INLET: AIR |
| PESO<br>WEIGHT                                                                         | 107 KG                                                                                                                          |                |

(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals



[illegible]

**FIG. 2.16**



J-WMHPSWT3 (REF. FIG. 2.16)

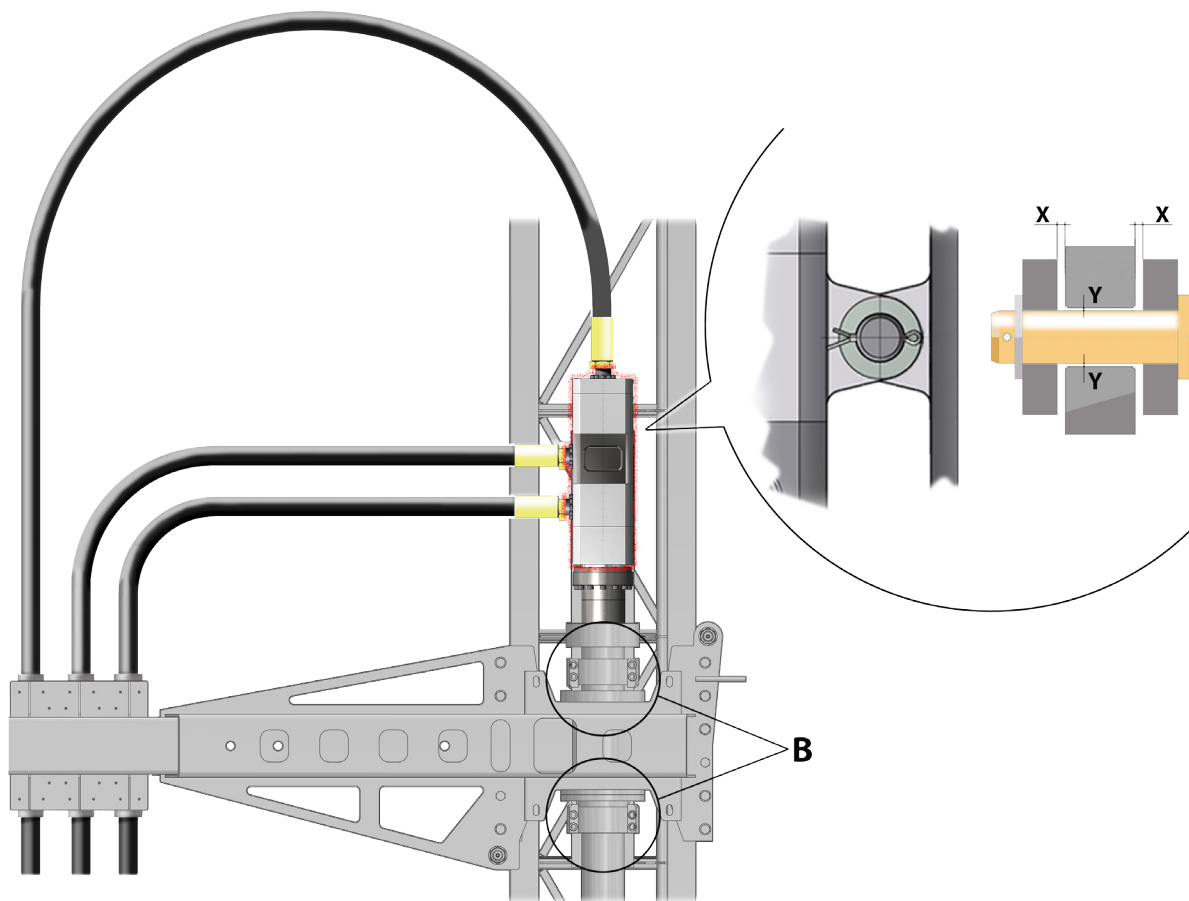
| REF. No. | CODICE CODE    | DESCRIZIONE                         | DESCRIPTION                     | QTY | NOTE |
|----------|----------------|-------------------------------------|---------------------------------|-----|------|
| 1        | J-WMHPSWT3-A   | KIT RICAMBI SWIVEL D.114 HP T3      | D.114 HP T3 SWIVEL SPARE PARTS  | 1   |      |
| 1.1      | J-WMHPSWT3-B   | KIT GUARNIZIONI SWIVEL D.114 HP T3  | D.114 HP T3 SWIVEL SEALS KIT    | 1   | (1)  |
| 1.1.1    | D-1731-20-A    | K35-P 111.8x118 L=4.5 T-ECOPUR      | K35-P 111.8x118 L=4.5 T-ECOPUR  | 1   |      |
| 1.1.2    | D-1731-20-B    | K35-P 61.8x68 L=4.5 T-ECOPUR        | K35-P 61.8x68 L=4.5 T-ECOPUR    | 4   |      |
| 1.1.3    | D-1731-20-C    | K35-P 35.8x42 L=4.5 T-ECOPUR        | K35-P 35.8x42 L=4.5 T-ECOPUR    | 4   |      |
| 1.1.4    | KIT-CH275196   | KIT-CH275196 (4+1 ELEMENTI)         | KIT-CH275196 (4+1 SEAL RINGS)   | 1   |      |
| 1.1.5    | KIT-CH354275   | KIT-CH354275 (4+1 ELEMENTI)         | KIT-CH354275 (4+1 SEAL RINGS)   | 1   |      |
| 1.1.6    | KIT-CH374295   | KIT-CH374295 (4+1 ELEMENTI)         | KIT-CH374295 (4+1 SEAL RINGS)   | 1   |      |
| 1.1.7    | MR-IG/R0500    | GUARN. IG/R 0500 RIF. POLYPAC       | IG/R 0500 ROTARY SEAL           | 1   |      |
| 1.1.8    | MR-EU95110     | GUARN. EU95x110x13 RIF. POLYPAC     | EU95x110x13 LIP SEAL            | 1   |      |
| 1.1.9    | MR-EU100115    | GUARN. EU100x115x13 RIF. POLYPAC    | EU100x115x13 LIP SEAL           | 1   |      |
| 1.1.10   | MR-A110X130X12 | PARAOLO A 110x130x12 SINGOLO LAB.   | 110x130x12 ONE LIP SEAL         | 1   |      |
| 1.1.11   | MR-OR126       | O-RING 126 RIF POLYPAC              | O-RING 126                      | 3   |      |
| 1.1.12   | MR-OR158       | O-RING 158 RIF POLYPAC              | O-RING 158                      | 2   |      |
| 1.1.13   | MR-OR235       | O-RING 235 RIF POLYPAC              | O-RING 235                      | 3   |      |
| 1.1.14   | MR-OR242       | O-RING 242 RIF POLYPAC              | O-RING 242                      | 3   |      |
| 1.1.15   | MR-OR244       | O-RING 244 RIF POLYPAC              | O-RING 244                      | 1   |      |
| 1.1.16   | MR-OR245       | O-RING 245 RIF. POLYPAC             | O-RING 245                      | 1   |      |
| 1.2      | MR-RNA4919     | CUSC. A RULLI RNA4919 110x130x35    | BEARING RNA4919 110x130x35      | 1   | (1)  |
| 1.3      | MR-51122       | CUSC. REGGISPINTA 110x145x25 DIN711 | AXIAL BEARING 110x145x25 DIN711 | 1   | (1)  |
| 1.4      | MR-33211       | CUSC. CONICO 3DE 55x100x35 ISO355   | BEARING 3DE 55x100x35 ISO355    | 1   | (1)  |
| 2        | D-1731-20-1    | ALBERO TESTA TRIPLA T3              | T3 SWIVEL SHAFT                 | 1   |      |
| 3        | D-1731-20-2    | TUBO ACQUA TESTA TRIPLA T3          | T3 SWIVEL WATER TUBE            | 1   |      |
| 4        | D-1731-20-3    | TUBO CEMENTO TESTA TRIPLA T3        | T3 SWIVEL GROUT TUBE            | 1   |      |
| 5        | D-1731-20-4    | STADIO N°4 TESTA T3                 | T3 SWIVEL N°4 BODY PART         | 1   |      |
| 6        | D-1731-20-5    | STADIO N°3 TESTA T3                 | T3 SWIVEL N°3 BODY PART         | 1   |      |
| 7        | D-1731-20-6    | FLANGIA INTERNA INFERIORE           | LOWER INNER FLANGE              | 1   |      |
| 8        | D-1731-20-7    | FLANGIA INTERNA SUPERIORE           | UPPER INNER FLANGE              | 1   |      |
| 9        | D-1731-20-8B   | STADIO N°2 TESTA T3-D2              | T3-D2 SWIVEL N°2 BODY PART      | 1   |      |
| 10       | D-1731-20-9    | STADIO N°1 TESTA T3                 | T3 SWIVEL N°1 BODY PART         | 1   |      |



J-WMHPSWT3 (REF. FIG. 2.16)

| REF. No. | CODICE CODE        | DESCRIZIONE                         | DESCRIPTION                 | QTY | NOTE |
|----------|--------------------|-------------------------------------|-----------------------------|-----|------|
| 11       | D-1731-20-10       | FLANGIA INTERNA ARIA                | INNER AIR FLANGE            | 1   |      |
| 12       | D-1731-20-11       | PERNO PER TESTA TRIPLA D.114 HP T3  | T3 SWIVEL PIN               | 1   |      |
| 13       | D-1731-20-12       | RONDELLA PERNO                      | PIN WASHER                  | 1   |      |
| 14       | D-1731-20-14       | STADIO N°5 TESTA T3-D2              | T3-D2 SWIVEL N°5 BODY PART  | 1   |      |
| 16       | D-1731-20-16       | DISTANZIALE INTERNO                 | INNER SPACER                | 1   |      |
| 17       | D-1731-20-17       | FLANGIA DI CHIUSURA                 | CLOSING FLANGE              | 1   |      |
| 18       | D-1731-20-24       | ENERGISER RING PER CH354275         | ENERGISER RING FOR CH354275 | 1   |      |
| 19       | D-1731-20-25       | BASE RING PER CH354275              | BASE RING FOR CH354275      | 1   |      |
| 20       | D-1731-30-20       | BASE RING PER CH 275196             | BASE RING FOR CH 275196     | 1   |      |
| 21       | D-1731-30-21       | ENERGISER RING PER CH275196         | ENERGISER RING FOR CH275196 | 1   |      |
| 22       | D-1731-30-22       | BASE RING PER CH374295              | BASE RING FOR CH374295      | 1   |      |
| 23       | D-1731-30-23       | ENERGISER RING PER CH374295         | ENERGISER RING FOR CH374295 | 1   |      |
| 24       | D-1731-30-24       | PORTAGUARNIZIONE SUPERIORE          | UPPER SEAL HOUSING          | 1   |      |
| 25       | D-1092-30          | STAFFA DI ATTACCO                   | ATTACHMENT BRACKET          | 1   |      |
| 26       | D-1176-8           | ATTACCO 1" 1/4 GAS TESTA D.114 K3   | 1"-1/4 G SWIVEL INLET       | 3   |      |
| 27       | SCHNORM8ZB         | RONDELLA SCHNORR M8 ZINCATA         | SCHNORR M8 WASHER           | 30  |      |
| 28       | SCHNORM10ZB        | RONDELLA SCHNORR M10 ZINCATA        | SCHNORR M10 WASHER          | 12  |      |
| 29       | SCHNORM12ZB        | RONDELLA SCHNORR M12 ZINCATA        | SCHNORR M12 WASHER          | 8   |      |
| 30       | 5931M6X20P1129GR   | VITE TCCE M6x20 UNI 5931 12.9       | UNI 5931 12.9 SCREW M6x20   | 12  |      |
| 31       | 5931M8X20P125129GR | VITE TCCE M8x20 UNI 5931 12.9       | UNI 5931 12.9 SCREW M8x20   | 62  |      |
| 32       | 5931M10X50P15129GR | VITE TCCE M10x50 UNI 5931 12.9      | UNI 5931 12.9 SCREW M10x50  | 12  |      |
| 33       | 5931M12X50175129GR | VITE TCCE M12x50 UNI 5931 12.9      | UNI 5931 12.9 SCREW M12x50  | 8   |      |
| 34       | 5931M16X160P2129GR | VITE TCCE M16x160 UNI 5931 12.9     | UNI 5931 12.9 SCREW M16x160 | 4   |      |
| 35       | 5931M16X200P2129GR | VITE TCCE M16x200 UNI 5931 12.9     | UNI 5931 12.9 SCREW M16x200 | 4   |      |
| 36       | 5933M10X35P15109GR | VITE TPSEI M10x35 UNI 5933 10.9     | UNI 5933 10.9 SCREW M10x35  | 12  |      |
| 37       | 7437D58S2          | ANELLO EL. PER FORI 58x2 UNI 7437   | SPRING RING UNI 7437 D.58x2 | 1   |      |
| 38       | 8735AD8X20         | SPINA CILINDR. D.8x20 UNI EN 8735 A | PIN D.8x20 UNI EN 8735 A    | 4   |      |
| 39       | 1336D5X36ZB        | COPIGLIA 5x36 UNI 1336 ZINCATA      | COTTER PIN 5x36 UNI 1336    | 1   |      |
| 40       | 71412AM8P125       | INGRASSATORE M8x1.25 DIN 71412A     | M8x1.25 LUBRICATOR          | 2   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 8h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

Lubricate the roller bearings at least every 8h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

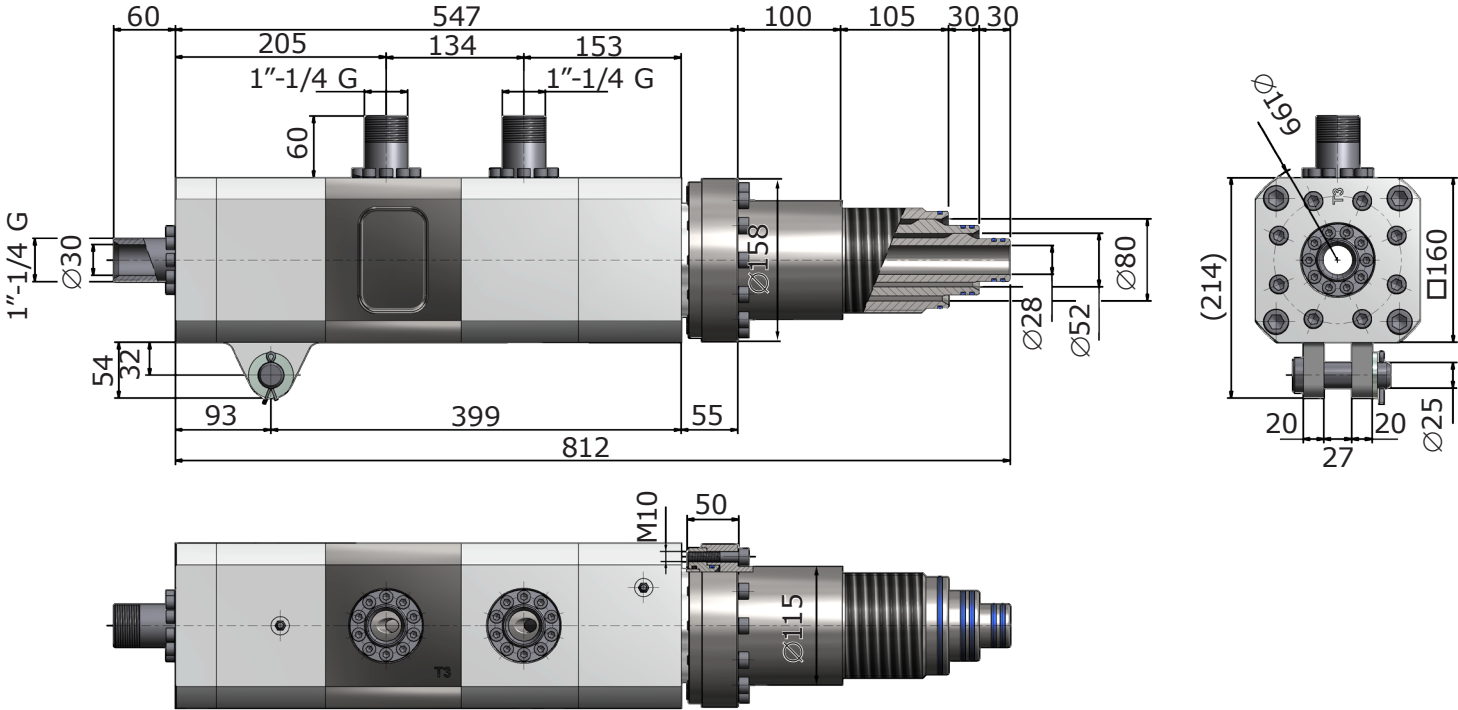
In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.



|                                                                                        |                                                                                                                                 |                             |                          |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------|
| CODICE<br>CODE                                                                         | J-WMHPSWT3                                                                                                                      |                             |                          |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa (CEMENTO / GROUT)<br>50 MPa (ACQUA / WATER)<br>3 MPa (ARIA / AIR)                                                        |                             |                          |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>45 MPa (ACQUA / WATER)<br>2,4 MPa (ARIA / AIR)                                                      |                             |                          |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                                 |                             |                          |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                                                |                             |                          |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 105 RPM (*)                                                                                                                     |                             |                          |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                                          |                             |                          |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 31 KN                                                                                                                           |                             |                          |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET: ACQUA E MISCELE<br>CEMENTO-ACQUA (RAPPORTO C:A<br>NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4) | 2ND INLET:<br>ACQUA - WATER | 3RD INLET:<br>ARIA - AIR |
| PESO<br>WEIGHT                                                                         | 59 KG (**)                                                                                                                      |                             |                          |

(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals

(\*\*): Peso con adattatore J-WMHPSAT3=71 KG - Weight with J-WMHPSAT3 ADAPTER=71 KG





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2.17 D.114 T3 TRIPLE FLUID SWIVEL-ROD ADAPTER J-XMHPSAT3

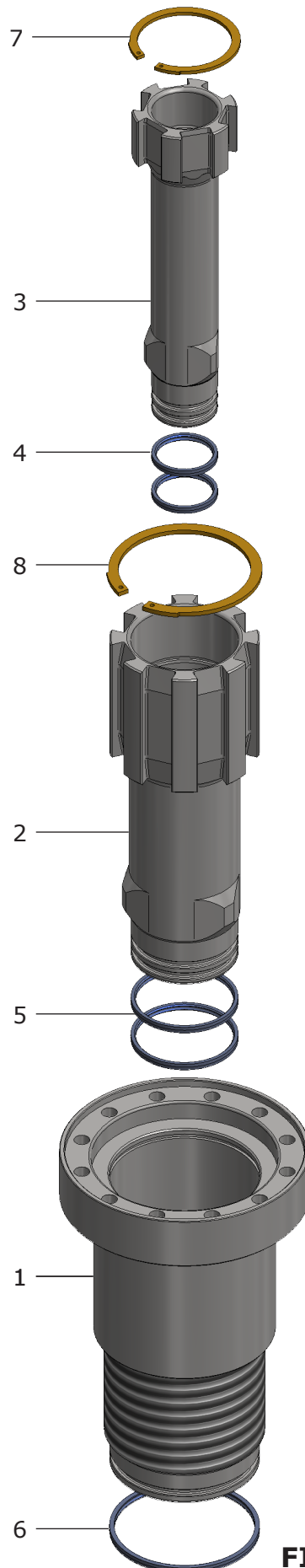


FIG. 2.17

**J-XMHPSAT3 (REF. FIG. 2.17)**

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION                  | QTY | NOTE |
|----------|--------------|-------------------------------------|------------------------------|-----|------|
| 1        | D-1731-21-1  | CORPO ESTERNO                       | EXTERNAL BODY                | 1   |      |
| 2        | D-1731-21-2  | CORPO INTERMEDIO                    | MIDDLE BODY                  | 1   |      |
| 3        | D-1731-21-3  | CORPO INTERNO                       | INNER BODY                   | 1   |      |
| 4        | D-1731-20-C  | K35-P 35.8x42 L=4.5 T-ECOPUR        | K35-P 35.8x42 L=4.5 T-ECOPUR | 2   |      |
| 5        | D-1731-20-B  | K35-P 61.8x68 L=4.5 T-ECOPUR        | K35-P 61.8x68 L=4.5 T-ECOPUR | 2   |      |
| 6        | D-1439-B     | K35P 88.8x95 L=4.5 T-ECOPUR         | K35P 88.8x95 L=4.5 T-ECOPUR  | 1   |      |
| 7        | SEEGJVD68S25 | ANELLO SEEGER PER FORI D.68 TIPO JV | D.68 LOCKING RING JV TYPE    | 1   |      |
| 8        | SEEGJVD95S3  | ANELLO SEEGER PER FORI D.95 TIPO JV | D.95 LOCKING RING JV TYPE    | 1   |      |

2.18 D.114 D2 SWIVEL J-WMHPSWD2 (GROUT-WATER) [J-AMHPSWD2 (GROUT-AIR)]

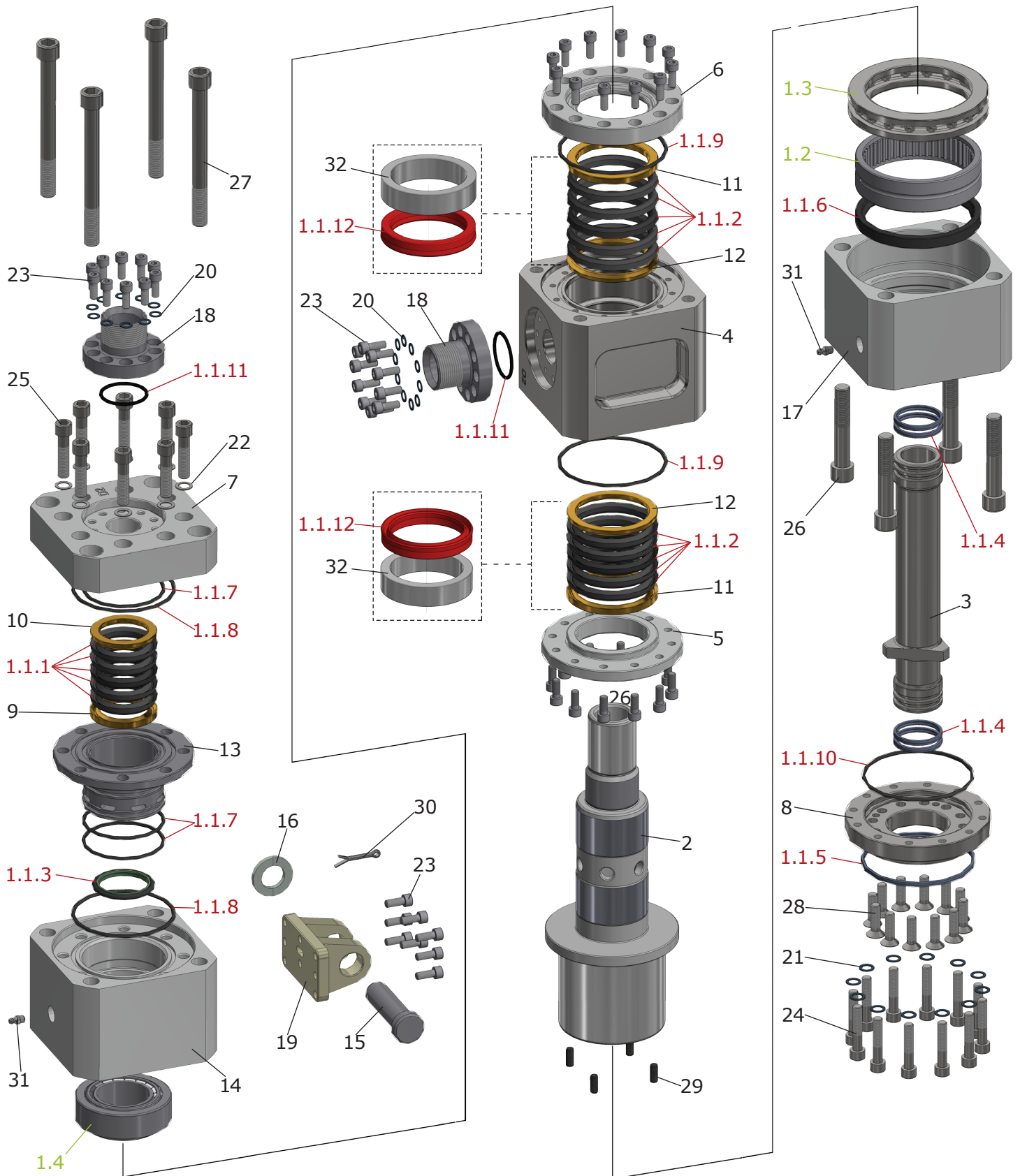


FIG. 2.18

| J-WMHPSWD2 (GROUT-WATER) [J-AMHPSWD2 (GROUT-AIR)] (REF. FIG. 2.18) |                |                                       |                                 |     |      |
|--------------------------------------------------------------------|----------------|---------------------------------------|---------------------------------|-----|------|
| REF. No.                                                           | CODICE CODE    | DESCRIZIONE                           | DESCRIPTION                     | QTY | NOTE |
| 1                                                                  | J-WMHPSWD2-A   | KIT RICAMBI SWIVEL D.114 D2           | D.114 D2 SWIVEL SPARE PARTS     | 1   | (2)  |
| 1.1                                                                | J-WMHPSWD2-B   | KIT GUARNIZIONI SWIVEL D.114 D2       | D.114 D2 SWIVEL SEALS KIT       | 1   | (3)  |
| 1.1.1                                                              | KIT-CH275196   | KIT CH275196 (4+1 ELEMENTI)           | KIT CH275196 SEAL (4+1 RINGS)   | 1   |      |
| 1.1.2                                                              | KIT-CH374295   | KIT CH374295 (4+1 ELEMENTI)           | KIT CH374295 SEAL (4+1 RINGS)   | 1   | (4)  |
| 1.1.3                                                              | MR-IG/R0500    | GUARN. IG/R 0500 RIF. POLYPAC         | IG/R 0500 ROTARY SEAL           | 1   |      |
| 1.1.4                                                              | D-1439-A       | K35-P 44.8x51 L=4.5 T-ECOPUR          | K35-P 44.8x51 L=4.5 T-ECOPUR    | 4   |      |
| 1.1.5                                                              | D-1731-20-A    | K35-P 111.8x118 L=4.5 T-ECOPUR        | K35-P 111.8x118 L=4.5 T-ECOPUR  | 1   |      |
| 1.1.6                                                              | MR-A110X130X12 | PARAOILIO A 110x130x12 SINGOLO LAB.   | 110x130x12 ONE LIP SEAL         | 1   |      |
| 1.1.7                                                              | MR-OR235       | O-RING 235 RIF POLYPAC                | O-RING 235                      | 3   |      |
| 1.1.8                                                              | MR-OR242       | O-RING 242 RIF POLYPAC                | O-RING 242                      | 2   |      |
| 1.1.9                                                              | MR-OR244       | O-RING 244 RIF POLYPAC                | O-RING 244                      | 2   |      |
| 1.1.10                                                             | MR-OR245       | O-RING 245 RIF. POLYPAC               | O-RING 245                      | 1   |      |
| 1.1.11                                                             | MR-OR827       | O-RING 827 RIF. POLYPAC               | O-RING 827                      | 2   |      |
| 1.1.12                                                             | MR-MU/P 9575   | GUARNIZIONE MU/P 95X75X14,5           | MU/P SEAL 95X75X14,5            | 2   | (5)  |
| 1.2                                                                | MR-RNA4919     | CUSC. A RULLI RNA4919 110x130x35      | BEARING RNA4919 110x130x35      | 1   | (1)  |
| 1.3                                                                | MR-51122       | CUSC. REGGISPINTA 110x145x25 DIN711   | AXIAL BEARING 110x145x25 DIN711 | 1   | (1)  |
| 1.4                                                                | MR-33211       | CUSC. CONICO 33211-3DE 55x100x35      | BEARING 33211-3DE 55x100x35     | 1   | (1)  |
| 2                                                                  | D-1731-30-1    | ALBERO TESTA D2                       | D2 SWIVEL SHAFT                 | 1   |      |
| 3                                                                  | D-1731-30-2    | TUBO CEMENTO TESTA D2                 | D2 SWIVEL GROUT TUBE            | 1   |      |
| 4                                                                  | D-1731-30-5    | STADIO N°3 TESTA D2                   | D2 SWIVEL N°3 BODY PART         | 1   |      |
| 5                                                                  | D-1731-30-6    | FLANGIA INTERNA INFERIORE             | LOWER INNER FLANGE              | 1   |      |
| 6                                                                  | D-1731-30-7    | FLANGIA INTERNA SUPERIORE             | UPPER INNER FLANGE              | 1   |      |
| 7                                                                  | D-1731-30-9    | STADIO N°1 TESTA D2                   | D2 SWIVEL N°1 BODY PART         | 1   |      |
| 8                                                                  | D-1731-30-17   | FLANGIA DI CHIUSURA                   | CLOSING FLANGE                  | 1   |      |
| 9                                                                  | D-1731-30-20   | BASE RING PER CH275196 A 5 ELEM.      | BASE RING CH275196 5 RINGS      | 1   |      |
| 10                                                                 | D-1731-30-21   | ENERGISER RING PER CH275196 A 5 ELEM. | ENERGISER RING CH275196 5 RINGS | 1   |      |
| 11                                                                 | D-1731-30-22   | BASE RING PER CH374295 A 5 ELEM.      | BASE RING CH374295 5 RINGS      | 1   | (4)  |
| 12                                                                 | D-1731-30-23   | ENERGISER RING PER CH374295 A 5 ELEM. | ENERGISER RING CH374295 5 RINGS | 1   | (4)  |
| 13                                                                 | D-1731-30-24   | PORTAGUARNIZIONE SUPERIORE            | UPPER SEAL HOUSING              | 1   |      |
| 14                                                                 | D-1731-20-8B   | STADIO N°2 TESTA T3-D2                | T3-D2 SWIVEL N°2 BODY PART      | 1   |      |
| 15                                                                 | D-1731-20-11   | PERNO PER TESTA TRIPLA D.114 HP T3    | T3 SWIVEL PIN                   | 1   |      |

| J-WMHPWD2 (GROUT-WATER) [J-AMHPWD2 (GROUT-AIR)] (REF. FIG. 2.18) |                    |                                     |                             |     |      |
|------------------------------------------------------------------|--------------------|-------------------------------------|-----------------------------|-----|------|
| REF. No.                                                         | CODICE CODE        | DESCRIZIONE                         | DESCRIPTION                 | QTY | NOTE |
| 16                                                               | D-1731-20-12       | RONDELLA PERNO                      | PIN WASHER                  | 1   |      |
| 17                                                               | D-1731-20-14       | STADIO N°5 TESTA T3-D2              | T3-D2 SWIVEL N°5 BODY PART  | 1   |      |
| 18                                                               | J-8C2TS709         | ATTACCO 1"-1/2 GAS                  | 1"-1/2 G SWIVEL INLET       | 2   |      |
| 19                                                               | D-1092-30          | STAFFA DI ATTACCO                   | ATTACHMENT BRACKET          | 1   |      |
| 20                                                               | SCHNORM8ZB         | RONDELLA SCHNORR M8 ZINCATA         | SCHNORR M8 WASHER           | 20  |      |
| 21                                                               | SCHNORM10ZB        | RONDELLA SCHNORR M10 ZINCATA        | SCHNORR M10 WASHER          | 12  |      |
| 22                                                               | SCHNORM12ZB        | RONDELLA SCHNORR M12 ZINCATA        | SCHNORR M12 WASHER          | 8   |      |
| 23                                                               | 5931M8X20P125129GR | VITE TCCE M8x20 UNI 5931 12.9       | UNI 5931 12.9 SCREW M8x20   | 52  |      |
| 24                                                               | 5931M10X50P15129GR | VITE TCCE M10x50 UNI 5931 12.9      | UNI 5931 12.9 SCREW M10x50  | 12  |      |
| 25                                                               | 5931M12X50175129GR | VITE TCCE M12x50 UNI 5931 12.9      | UNI 5931 12.9 SCREW M12x50  | 8   |      |
| 26                                                               | 5931M16X90P2129GR  | VITE TCCE M16x90 UNI 5931 12.9      | UNI 5931 12.9 SCREW M16x90  | 4   |      |
| 27                                                               | 5931M16X160P2129GR | VITE TCCE M16x160 UNI 5931 12.9     | UNI 5931 12.9 SCREW M16x160 | 4   |      |
| 28                                                               | 5933M10X35P15109GR | VITE TPSEI M10x35 UNI 5933 10.9     | UNI 5933 10.9 SCREW M10x35  | 12  |      |
| 29                                                               | 8735AD8X20         | SPINA CILINDR. D.8x20 UNI EN 8735 A | PIN D.8x20 UNI EN 8735 A    | 4   |      |
| 30                                                               | 1336D5X36ZB        | COPIGLIA 5x36 UNI 1336 ZINCATA      | COTTER PIN 5x36 UNI 1336    | 1   |      |
| 31                                                               | 71412AM8P125       | INGRASSATORE M8x1.25 DIN 71412A     | M8x1.25 LUBRICATOR          | 2   |      |
| 32                                                               | D-1731-30-25       | DISTANZIALE INTERNO ARIA D2         | INNER SPACER FOR AIR D2     | 2   | (5)  |

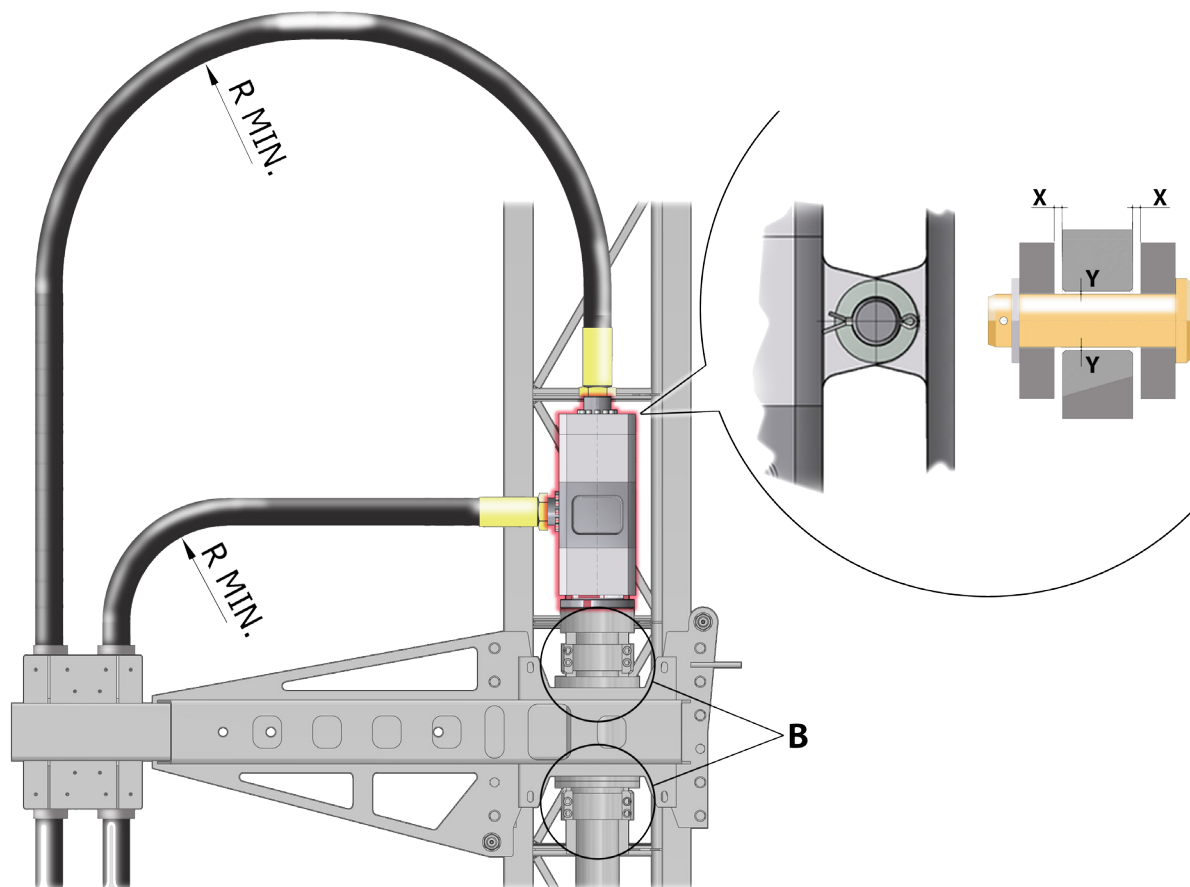
(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

(2) CODICE J-AMHPWD2-A PER SWIVEL CEMENTO-ARIA - CODE J-AMHPWD2-A FOR GROUT-AIR SWIVEL VERSION

(3) CODICE J-AMHPWD2-B PER SWIVEL CEMENTO-ARIA - CODE J-AMHPWD2-B FOR GROUT-AIR SWIVEL VERSION

(4) NON USATO PER SWIVEL CEMENTO-ARIA J-AMHPWD2 - NOT USED FOR J-AMHPWD2 GROUT-AIR SWIVEL

(5) NON USATO PER SWIVEL CEMENTO-ACQUA J-WMHPWD2 - NOT USED FOR J-WMHPWD2 GROUT-WATER SWIVEL



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

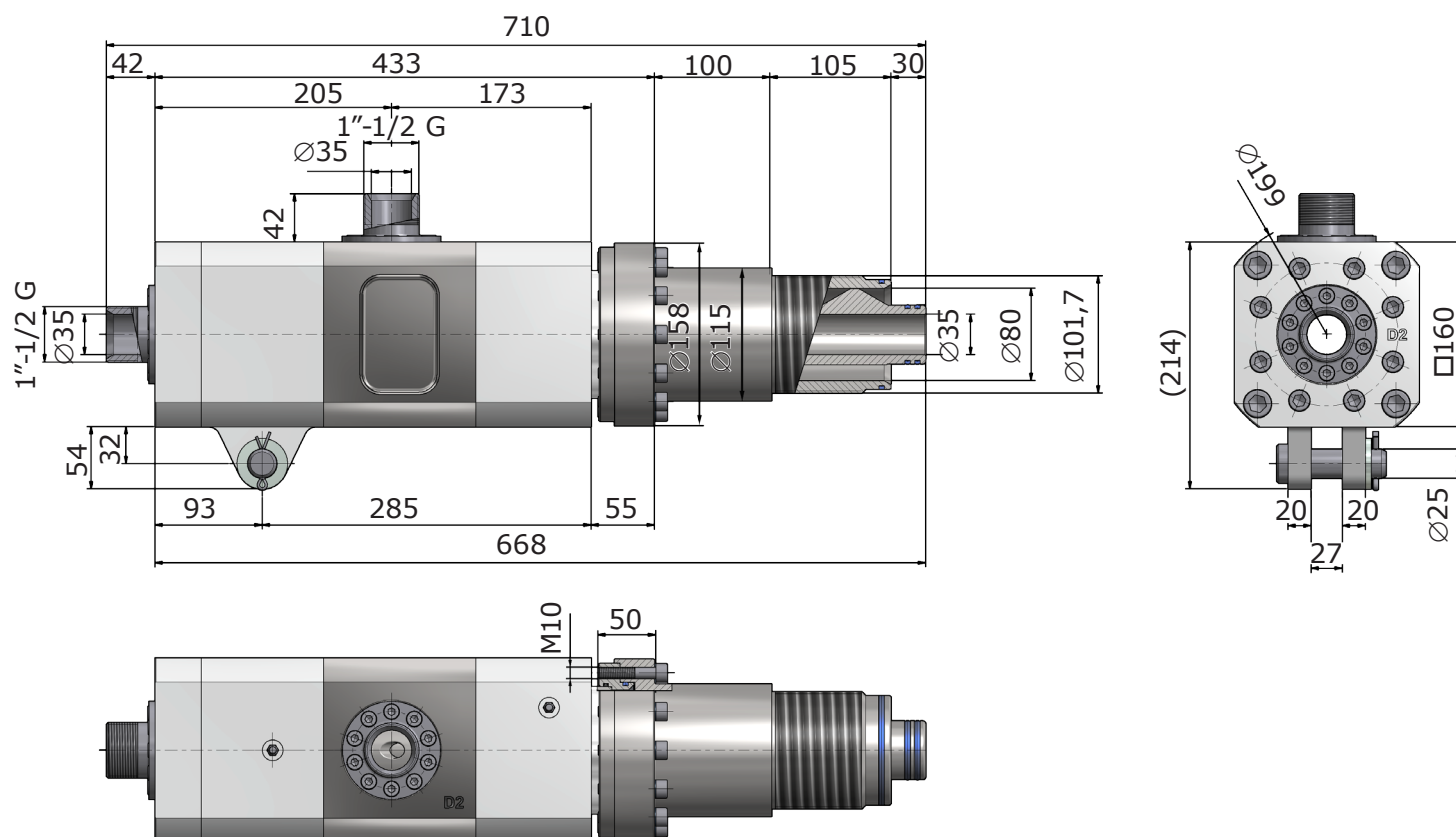
Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

| CODICE<br>CODE                                                                         | J-AMHPSWD2                                                                                                                                        | J-WMHPSWD2                                                                                                                                          |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 56 MPa (CEMENTO / GROUT)<br>3 MPa (ARIA / AIR)                                                                                                    | 56 MPa (CEMENTO / GROUT)<br>56 MPa (ACQUA / WATER)                                                                                                  |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>2,4 MPa (ARIA / AIR)                                                                                                  | 40 MPa (CEMENTO / GROUT)<br>45 MPa (ACQUA / WATER)                                                                                                  |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                                                   | -30°C / +120 °C                                                                                                                                     |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                                                                  |                                                                                                                                                     |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 85-105 RPM                                                                                                                                        |                                                                                                                                                     |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                                                            |                                                                                                                                                     |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 31 KN                                                                                                                                             |                                                                                                                                                     |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET: ACQUA E MISCELE<br>CEMENTO-ACQUA (RAPPORTO C:A<br>NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4)<br>2ST INLET: AIR | 1ST INLET: ACQUA E MISCELE<br>CEMENTO-ACQUA (RAPPORTO C:A<br>NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4)<br>2ST INLET: WATER |
| PESO<br>WEIGHT                                                                         | 46 KG                                                                                                                                             |                                                                                                                                                     |





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2.19 D.114 D2 SWIVEL-ROD ADAPTER J-WMHPSAD2

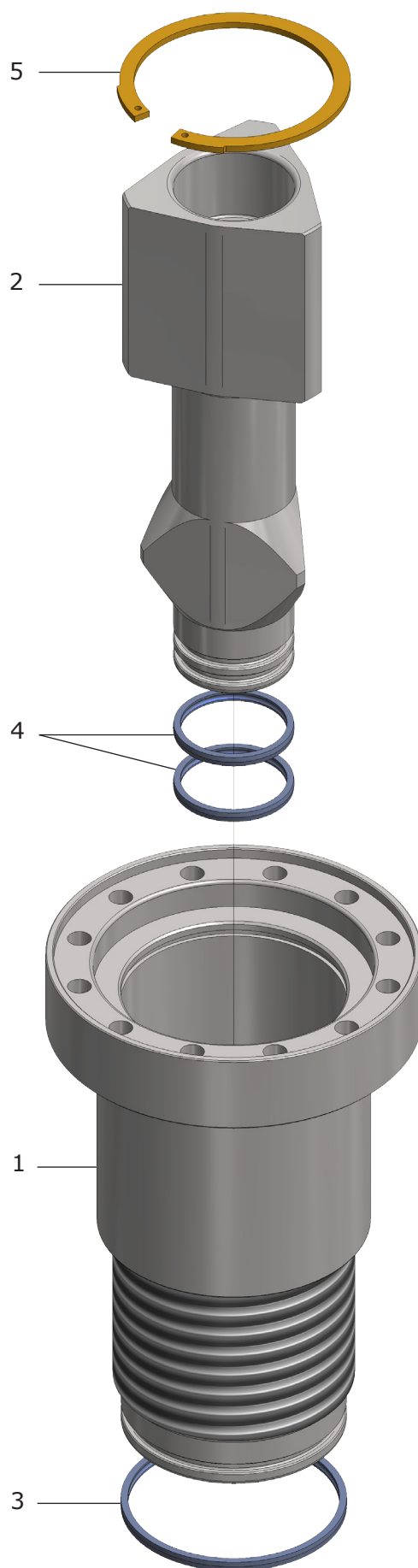
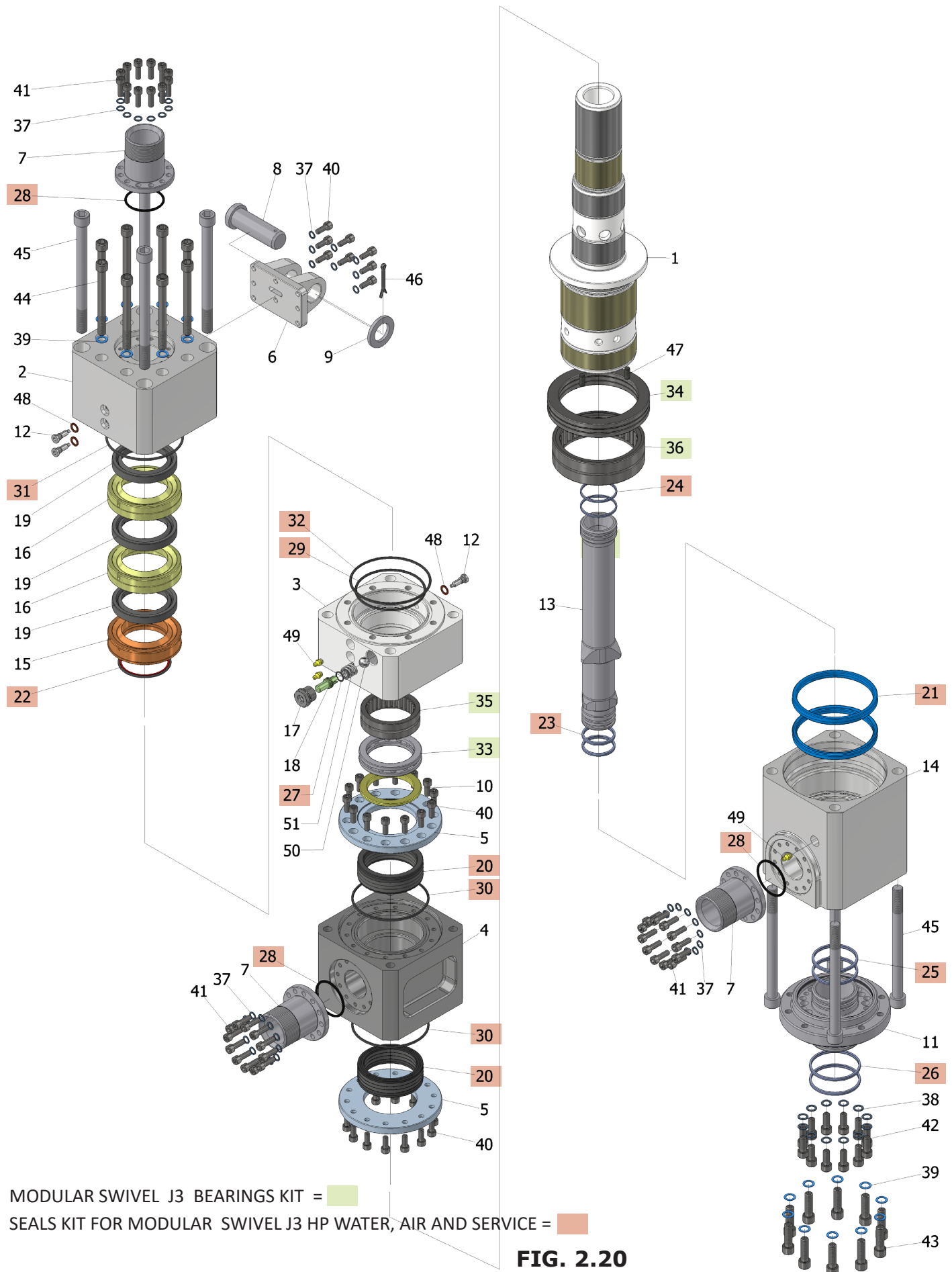


FIG. 2.19



| J-WMHPSAD2 (REF. FIG. 2.19) |             |                                     |                              |     |      |
|-----------------------------|-------------|-------------------------------------|------------------------------|-----|------|
| REF. No.                    | CODICE CODE | DESCRIZIONE                         | DESCRIPTION                  | QTY | NOTE |
| 1                           | D-1731-21-1 | CORPO ESTERNO                       | EXTERNAL BODY                | 1   |      |
| 2                           | D-1731-31-2 | CORPO INTERNO                       | INNER BODY                   | 1   |      |
| 3                           | D-1439-B    | K35P 88.8x95 L=4.5 T-ECOPUR         | K35P 88.8x95 L=4.5 T-ECOPUR  | 1   |      |
| 4                           | D-1439-A    | K35-P 44.8x51 L=4.5 T-ECOPUR        | K35-P 44.8x51 L=4.5 T-ECOPUR | 2   |      |
| 5                           | SEEGJVD95S3 | ANELLO SEEGER PER FORI D.95 TIPO JV | D.95 LOCKING RING JV TYPE    | 1   |      |

## 2.20 D.127 J3 SWIVEL J-WMHPS4J3 (GROUT-WATER-AIR)





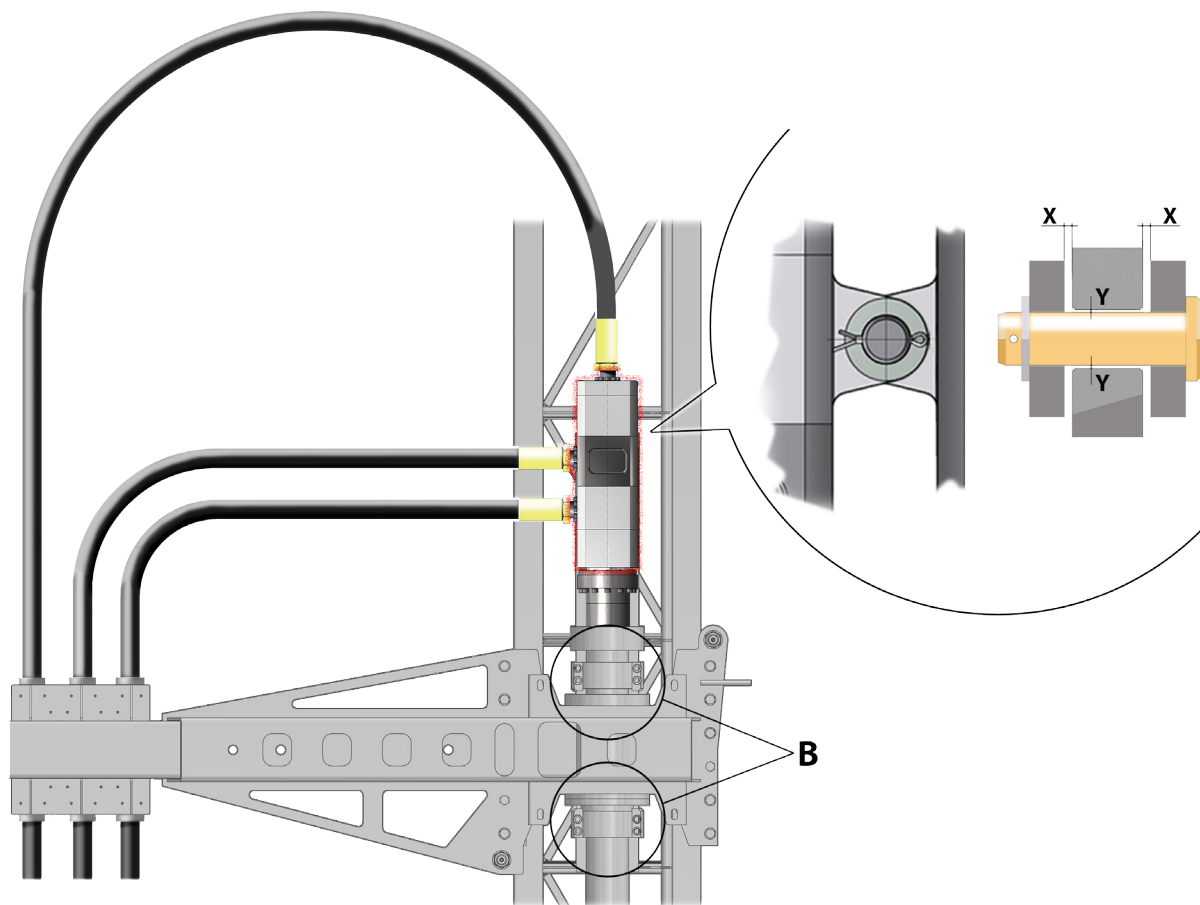
J-WMHP54J3 (GROUT-WATER-AIR) (REF. FIG. 2.20)

| REF. No. | CODICE CODE           | DESCRIZIONE                                  | DESCRIPTION                | QTY | NOTE |
|----------|-----------------------|----------------------------------------------|----------------------------|-----|------|
| 1        | 1410F-1               | ALBERO MODULAR HP SWIVEL D.127 C3            | J3 HP SWIVEL SHAFT         | 1   |      |
| 2        | 1410J2-2              | STADIO N°1 TIPO F                            | SWIVEL BODY N.1 F TYPE     | 1   |      |
| 3        | 1410J2-3              | STADIO N°2 TIPO F                            | SWIVEL BODY N.2 F TYPE     | 1   |      |
| 4        | 1410-5B               | STADIO N°3 VERSIONE CON SEDI SIMMETRICHE     | SWIVEL BODY N.3            | 1   |      |
| 5        | 1410-6B               | FLANGIA INTERNA PER CORPO A SEDI SIMMETRICHE | INNER FLANGE               | 2   |      |
| 6        | 1410-8-2              | STAFFA DI ATTACCO                            | ATTACHMENT BRACKET         | 1   |      |
| 7        | 1410-10               | ATTACCO 2" GAS                               | 2" GAS INLET               | 3   |      |
| 8        | 1410-11               | PERNO                                        | PIN                        | 1   |      |
| 9        | 1410-12               | RONDELLA PER PERNO                           | PIN WASHER                 | 1   |      |
| 10       | 1410F-15              | ANELLO BATTUTA CUSCINETTO ANTERIORE          | FRONT BEARING SPACER       | 1   |      |
| 11       | 1410F-16              | FLANGIA ATTACCO ASTA D.127 C3                | D.127 C3 ROD FLANGE        | 1   |      |
| 12       | 1410-20K-4            | PERNO ANTIGIRO                               | ANTI-SPIN PIN              | 3   |      |
| 13       | 1410-20-35            | TUBO INTERNO PER MODULAR SWIVEL D.127 C3     | D.127 C3 SWIVEL INNER PIPE | 1   |      |
| 14       | 1410-20-37            | STADIO N°4 PER TERZA VIA                     | SWIVEL BODY N.4            | 1   |      |
| 15       | 602-32H               | ANELLO POSTERIORE PER GUARNIZIONE 602-25     | 602-25 SEAL BACK RING      | 1   |      |
| 16       | 602-32                | DISTANZIALE PER GUARNIZIONE 602-25           | 602-25 SEAL SPACER         | 2   |      |
| 17       | 1410J2-20             | GHIERA PER SPIA CEMENTO                      | SAFETY PORT NUT            | 1   |      |
| 18       | 1410J2-21             | SPIA CEMENTO                                 | SAFETY PORT BODY           | 1   |      |
| 19       | 602-25                | GUARNIZIONE 602-25 d.2,75"                   | SEAL 602-25 d.2,75"        | 3   |      |
| 37       | RONDELLA SHNORR M8    | RONDELLA DI SICUREZZA                        | SAFETY WASHER              | 44  |      |
| 38       | RONDELLA SHNORR M10   | RONDELLA DI SICUREZZA                        | SAFETY WASHER              | 12  |      |
| 39       | RONDELLA SHNORR M12   | RONDELLA DI SICUREZZA                        | SAFETY WASHER              | 18  |      |
| 40       | UNI 5931 - M 8 x 20   | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 36  |      |
| 41       | UNI 5931 - M 8 x 25   | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 36  |      |
| 42       | UNI 5931 - M 10 x 25  | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 12  |      |
| 43       | UNI 5931 - M 12 x 40  | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 10  |      |
| 44       | UNI 5931 - M 12 x 120 | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 8   |      |
| 45       | UNI 5931 - M 16 x 200 | VITE TCCE CL.12.9                            | CL.12.9 SOCKET HEAD SCREW  | 8   |      |
| 46       | UNI 1336 - 5 x 45     | COPIGLIA                                     | COTTER PIN                 | 1   |      |
| 47       | ISO 8735 - 8 x 20 - A | SPINA CILINDRICA                             | PIN                        | 4   |      |
| 48       | J-CU18                | GUARNIZIONE RAME 1/8"                        | 1/8" COPPER WASHER         | 3   |      |

J-WMHP4J3 (GROUT-WATER-AIR) (REF. FIG. 2.20)

| REF. No. | CODICE CODE                             | DESCRIZIONE                                                        | DESCRIPTION                                                | QTY | NOTE |
|----------|-----------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------|-----|------|
| 49       | 71412AM8P125                            | INGRASSATORE M8                                                    | M8 LUBRICATOR                                              | 3   |      |
| 50       | SFERA ACCIAIO AL CROMO D.16 (SKF RB-16) | SFERA SKF ACCIAIO AL CROMO 62-65 HRC                               | STEEL BALL                                                 | 1   |      |
| 51       | J00TP206                                | MOLLA 70 BAR Do=18.8 Di=12 d=3.4 Lo=27 54SiCr6 DIN17223/2          | SPRING 70 BAR Do=18.8 Di=12 d=3.4 Lo=27 54SiCr6 DIN17223/2 | 1   |      |
| -        | J-WMHP4J3-A                             | KIT CUSCINETTI MODULAR SW. J3                                      | J3 HP SWIVEL BEARINGS KIT                                  |     |      |
| 33       | 51114                                   | CUSCINETTO A SFERE REGGISPINTA 70x95x18                            | THRUST BEARING 70x95x18                                    | 1   | (1)  |
| 34       | 51124                                   | CUSCINETTO REGGISPINTA A SFERE 120x155x25                          | THRUST BEARING 120x155x25                                  | 1   | (1)  |
| 35       | NKS 70                                  | CUSCINETTO A RULLINI 70x90x28                                      | ROLLER BEARING 70x90x28                                    | 1   | (1)  |
| 36       | RNA 4920                                | CUSCINETTO A RULLINI 115x140x40                                    | ROLLER BEARING 115x140x40                                  | 1   | (1)  |
|          | J-WMHP4J3-B                             | KIT GUARNIZ. SWIVEL J3 HP WATER, AIR AND SERVICE                   | SEALS KIT SWIVEL J3 HP WATER, AIR AND SERVICE              |     |      |
| 20       | CH393314                                | GUARNIZIONE CH 80x100x30                                           | CHEVRON SEAL 80x100x30                                     | 2   | (1)  |
| 21       | GUARNIZIONE A LABBRO ASTON A 115 130 11 | GUARNIZIONE A LABBRI ASIMMETRICI 115x130x11 POLIURETANO 93 SHORE A | LIP SEAL 115x130x11                                        | 2   | (1)  |
| 22       | XRB 70 81 4.2                           | GUARNIZIONE ASTON PER STELO ROTANTE                                | ROTARY SEAL                                                | 1   | (1)  |
| 23       | K35-P 44.8x51x4.5 (D-1439-A)            | GUARNIZIONE POLIURETANO (T-ECOPUR)                                 | POLIURETHANE SEAL                                          | 2   | (1)  |
| 24       | K35-P 56x51.5x3.5 (D-1410-A)            | GUARNIZIONE POLIURETANO (T-ECOPUR)                                 | POLIURETHANE SEAL                                          | 2   | (1)  |
| 25       | K35-P 70x63.8x4.5 (D-1354-D)            | GUARNIZIONE T-ECOPUR                                               | POLIURETHANE SEAL                                          | 2   | (1)  |
| 26       | K35-P 71.8x78x4.5 (D-1354-B)            | GUARNIZIONE POLIURETANO (T-ECOPUR)                                 | POLIURETHANE SEAL                                          | 2   | (1)  |
| 27       | OR 014                                  | O-RING                                                             | O-RING SEAL                                                | 1   | (1)  |
| 28       | OR 227                                  | O-RING                                                             | O-RING SEAL                                                | 3   | (1)  |
| 29       | OR 242                                  | O-RING                                                             | O-RING SEAL                                                | 1   | (1)  |
| 30       | OR 245                                  | O-RING                                                             | O-RING SEAL                                                | 2   | (1)  |
| 31       | OR 246                                  | O-RING                                                             | O-RING SEAL                                                | 1   | (1)  |
| 32       | OR 247                                  | O-RING                                                             | O-RING SEAL                                                | 2   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 8h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

Lubricate the roller bearings at least every 8h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

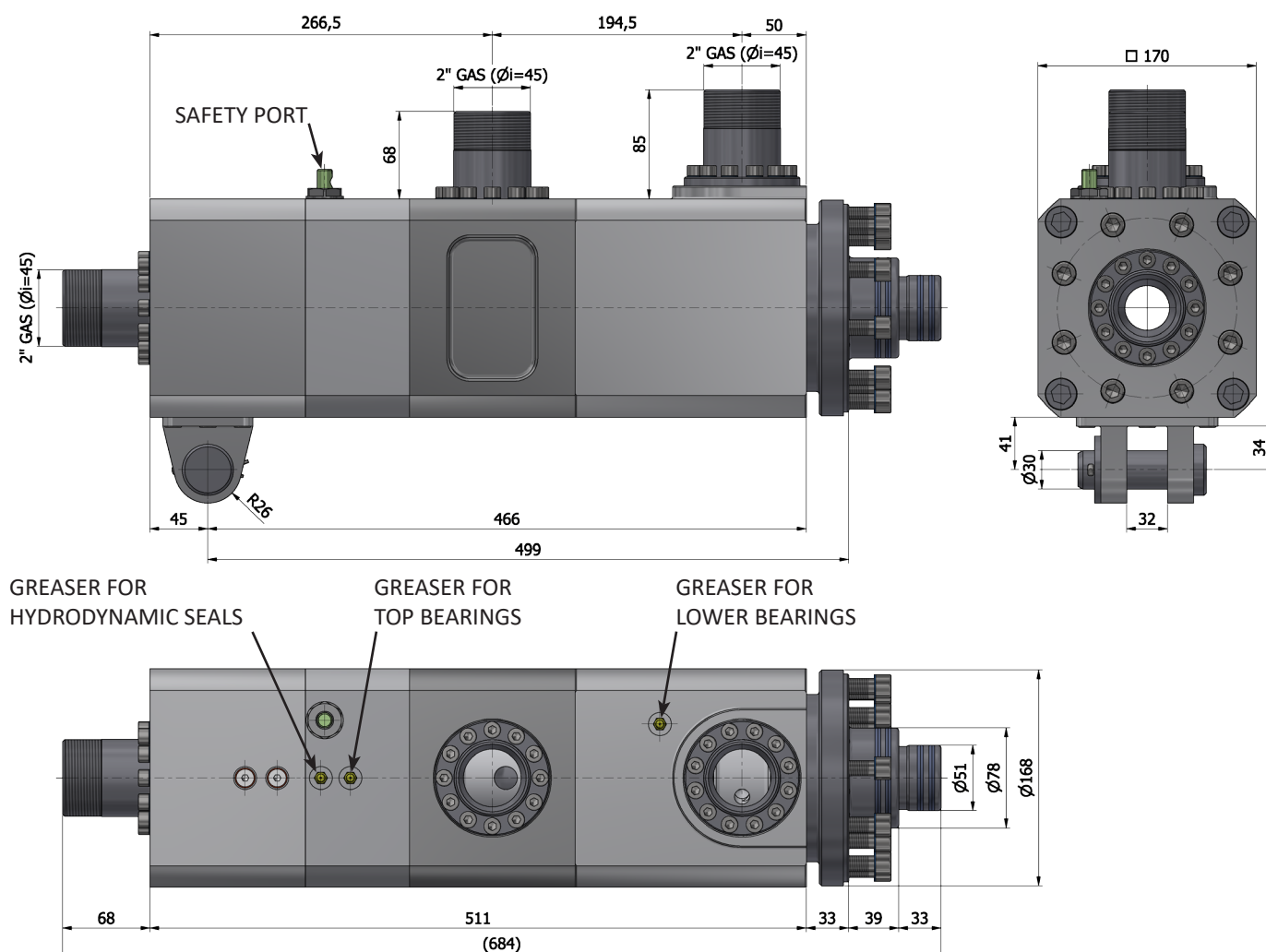
### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                                     |                   |                 |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|
| CODICE<br>CODE                                                                         | J-WMHPS4J3                                                                                                          |                   |                 |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa (CEMENTO / GROUT)<br>42 MPa (ACQUA / WATER)<br>3 MPa (ARIA / AIR)                                            |                   |                 |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>40 MPa (ACQUA / WATER)<br>2,4 MPa (ARIA / AIR)                                          |                   |                 |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                     |                   |                 |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 25 RPM (MAX 2 h)                                                                                                    |                   |                 |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 150 RPM (*)                                                                                                         |                   |                 |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                              |                   |                 |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 39 KN                                                                                                               |                   |                 |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET: ACQUA E MISCELE CEMENTO-ACQUA (RAPP. C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX (RATIO G:W MAX 1,4) | 2 ND INLET: WATER | 3 RD INLET: AIR |
| PESO<br>WEIGHT                                                                         | 69,4 KG                                                                                                             |                   |                 |

**(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals**





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2.21 D.127 C3 SWIVEL-ROD ADAPTER J-XMHPA4C3

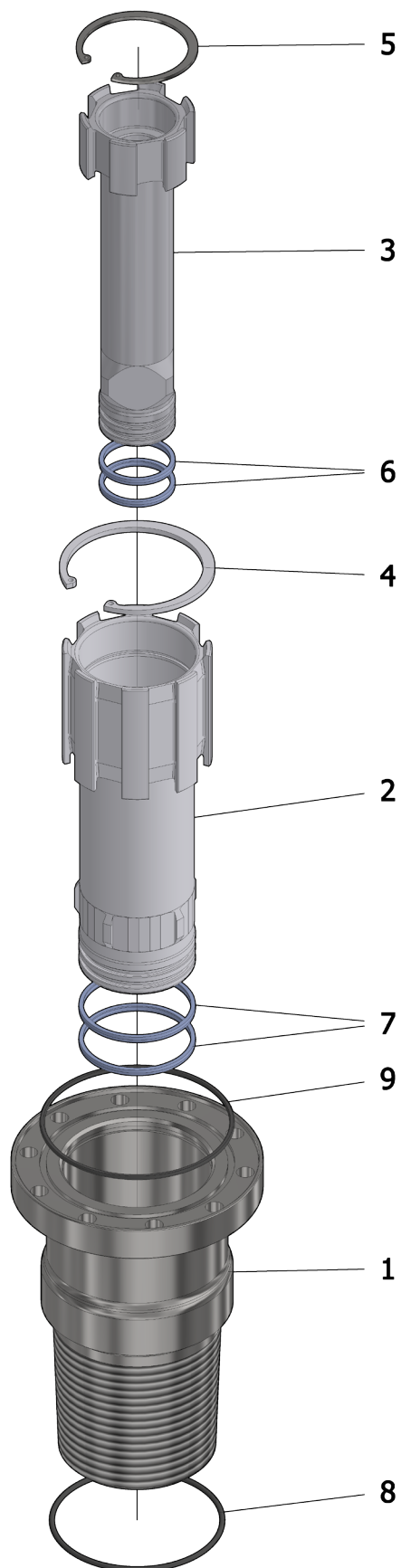
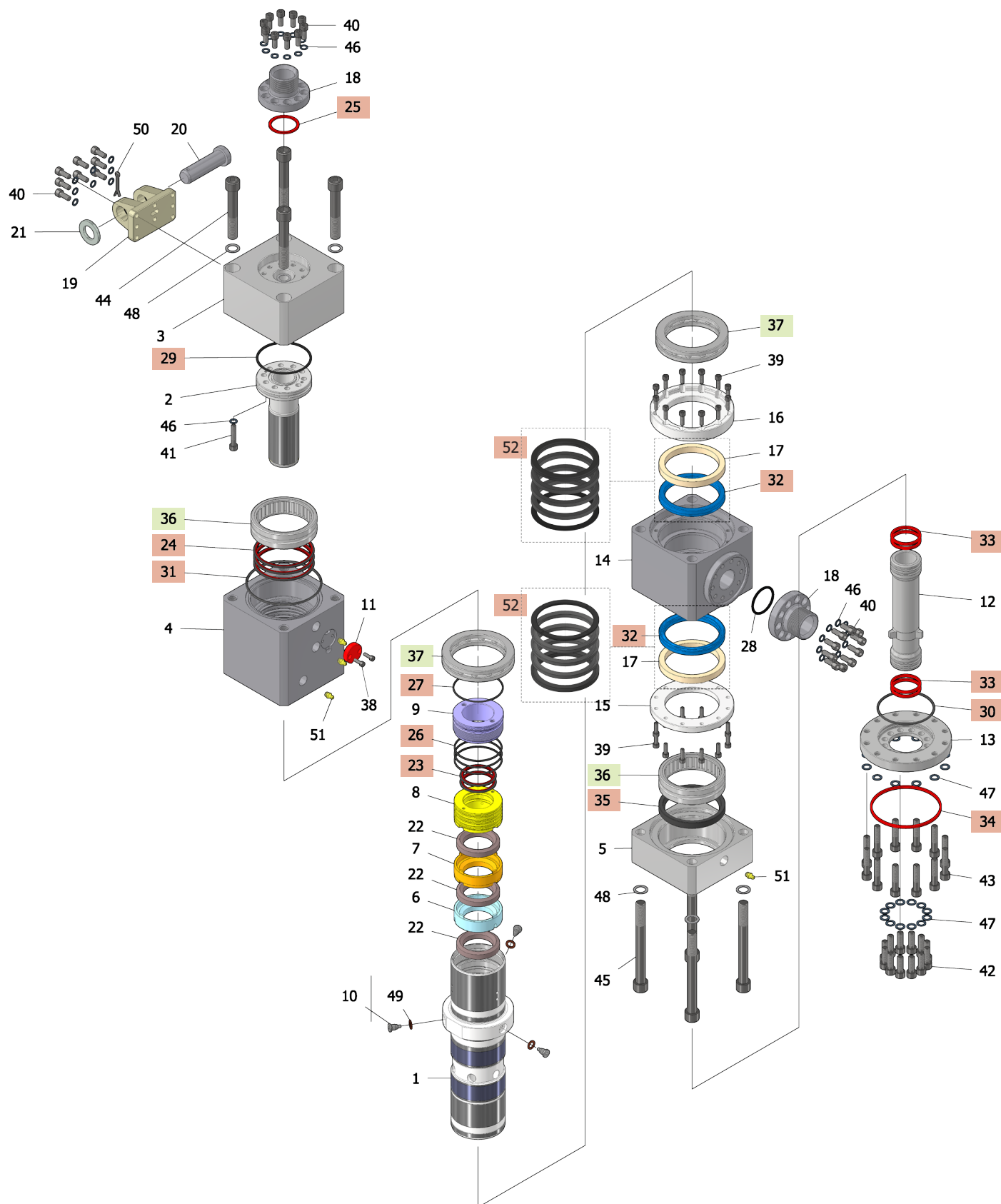


FIG. 2.21

| J-XMHPA4C3 (REF. FIG. 2.21) |              |                              |                              |     |      |
|-----------------------------|--------------|------------------------------|------------------------------|-----|------|
| REF. No.                    | CODICE CODE  | DESCRIZIONE                  | DESCRIPTION                  | QTY | NOTE |
| 1                           | D-1354-546-1 | CORPO ESTERNO                | EXTERNAL BODY                | 1   |      |
| 2                           | D-1354-546-2 | CORPO INTERMEDIO             | MIDDLE BODY                  | 1   |      |
| 3                           | D-1354-546-3 | CORPO INTERNO                | INNER BODY                   | 1   |      |
| 4                           | 7438D100S4   | ANELLO SEEGER PER FORI D.100 | D.100 LOCKING RING           | 1   |      |
| 5                           | 7437D78S25   | ANELLO SEEGER PER FORI D.78  | D.78 LOCKING RING            | 1   |      |
| 6                           | D-1439-A     | K35-P 44.8x51 L=4.5 T-ECOPUR | K35-P 44.8x51 L=4.5 T-ECOPUR | 2   |      |
| 7                           | D-1354-B     | K35P 71.8x78 L=4.5 T-ECOPUR  | K35P 71.8x78 L=4.5 T-ECOPUR  | 2   |      |
| 8                           | MR-OR244     | O-RING 244 RIF. POLYPAC      | O-RING 244 REF. POLYPAC      | 1   |      |
| 9                           | MR-OR249     | O-RING 249 RIF. POLYPAC      | O-RING 249 REF. POLYPAC      | 1   |      |

## 2.22 MODULAR HP SWIVEL HYDRODYNAMIC ROTATING SEALS [J-AMHPSWJ2 / J-WMHPSWJ2]



BEARINGS KIT =

SEALS KIT WATER, AIR AND SERVICE =

**FIG. 2.22**

J-AMHPSWJ2 (GROUT-AIR) / J-WMHPSWJ2 (GROUT-WATER) (REF. FIG. 2.22)

| REF. No. | CODICE CODE           | DESCRIZIONE                                              | DESCRIPTION                   | QTY | NOTE |
|----------|-----------------------|----------------------------------------------------------|-------------------------------|-----|------|
| 1        | 2155-1BF              | ALBERO ROTANTE                                           | ROTATING SHAFT                | 1   |      |
| 2        | 2155-2                | ALBERO INTERNO                                           | INNER SHAFT                   | 1   |      |
| 3        | 2155-3                | CORPO SUPERIORE                                          | UPPER BODY                    | 1   |      |
| 4        | 2155-4BF              | CORPO CENTRALE                                           | MIDDLE BODY                   | 1   |      |
| 5        | 2155-5BF              | CORPO INFERIORE                                          | LOWER BODY                    | 1   |      |
| 6        | 2155-6                | DISTANZIALE PORTA-GUARNIZIONE ANTERIORE<br>602-33 KALSI  | 602-33 FRONT SEAL HOUSING     | 1   |      |
| 7        | 2155-7                | DISTANZIALE PORTA-GUARNIZIONE CENTRALE<br>602-33 KALSI   | 602-33 MIDDLE SEAL HOUSING    | 1   |      |
| 8        | 2155-8                | DISTANZIALE PORTA-GUARNIZIONE POSTERIORE<br>602-33 KALSI | 602-33 REAR SEAL HOUSING      | 1   |      |
| 9        | 2155-9                | GHIERA CHIUSURA PORTA-GUARNIZIONI                        | SEAL HOUSING CLOSING NUT      | 1   |      |
| 10       | 2155-10               | PERNO ANTIGIRO                                           | ANTI-SPIN PIN                 | 3   |      |
| 11       | 2155-11               | CALOTTA PER FORO SPIA CEMENTO                            | SAFETY PORT CUP               | 1   |      |
| 12       | 2155-13               | TUBO CEMENTO                                             | GROUT TUBE                    | 1   |      |
| 13       | 2155-14               | FLANGIA DI CHIUSURA                                      | CLOSING FLANGE                | 1   |      |
| 14       | 2155-15               | CORPO INTERMEDIO ARIA/ACQUA                              | AIR / WATER INTERMEDIATE BODY | 1   |      |
| 15       | 2155-16               | ANELLO PREMIGUARNIZIONI INFERIORE                        | LOWER SEAL RING               | 1   |      |
| 16       | 2155-17               | ANELLO PREMIGUARNIZIONI SUPERIORE                        | UPPER SEAL RING               | 1   |      |
| 17       | 2155-18               | DIATANZIALE GUARNIZIONI ARIA                             | AIR SEAL SPACER               | 2   | (2)  |
| 18       | 1092-7                | ATTACCO 1"-1/2 GAS                                       | 1"-1/2 GAS INLET              | 2   |      |
| 19       | 1092-30               | STAFFA DI ATTACCO                                        | ATTACHMENT BRACKET            | 1   |      |
| 20       | 1731-20-11            | PERNO                                                    | PIN                           | 1   |      |
| 21       | 1731-20-12            | RONDELLA                                                 | PIN WASHER                    | 1   |      |
| 22       | 602-33                | GUARNIZIONE KALSI Di=50 mm                               | I.D. 50 mm KALSI SEAL         | 3   |      |
| 38       | UNI 5931 - M 5 x 16   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 2   |      |
| 39       | UNI 5931 - M 6 x 20   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 24  |      |
| 40       | UNI 5931 - M 8 x 20   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 28  |      |
| 41       | UNI 5931 - M 8 x 40   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 10  |      |
| 42       | UNI 5931 - M 10 x 30  | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 12  |      |
| 43       | UNI 5931 - M 10 x 50  | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 12  |      |
| 44       | UNI 5931 - M 16 x 100 | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 4   |      |
| 45       | UNI 5931 - M 16 x 160 | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW     | 4   |      |
| 46       | RONDELLA SHNORR M8    | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                 | 38  |      |

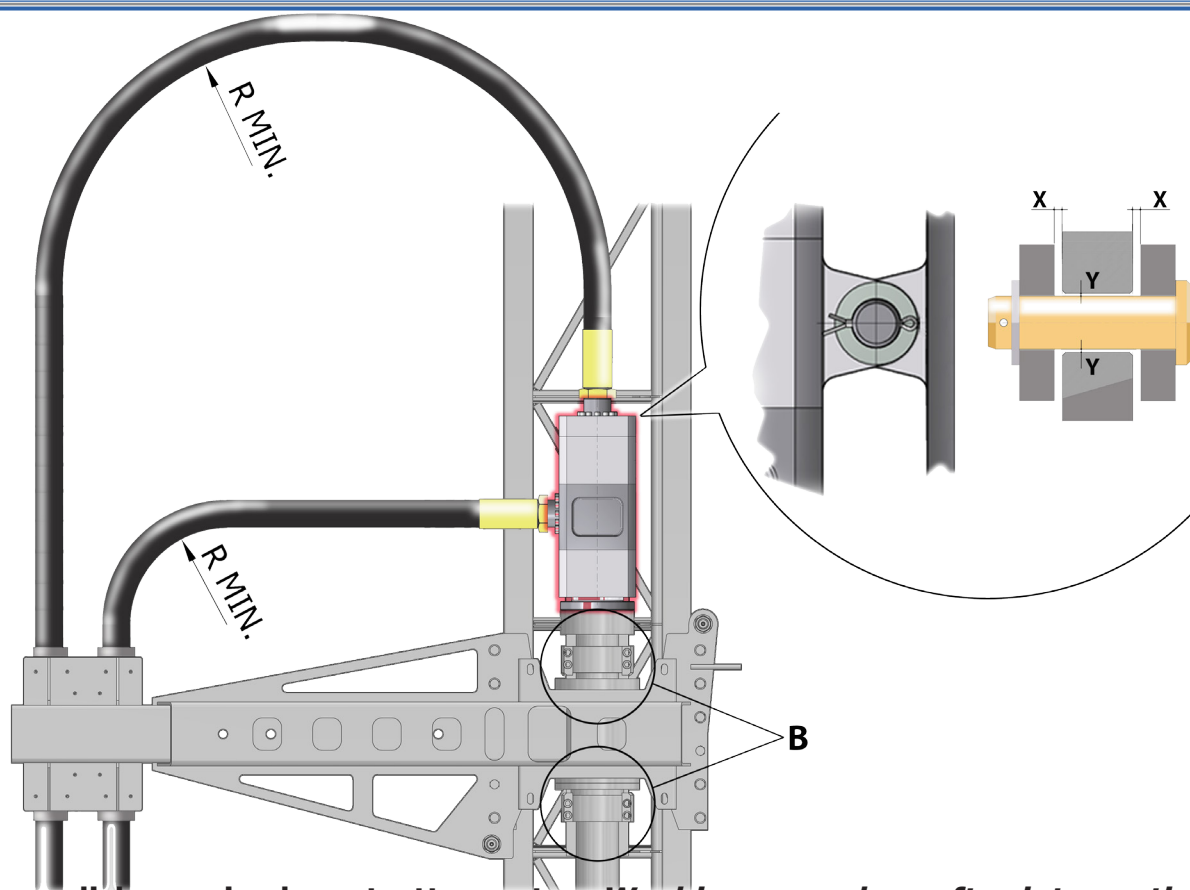


| J-AMHPSWJ2 (GROUT-AIR) / J-WMHPWSWJ2 (GROUT-WATER) (REF. FIG. 2.22) |                                     |                                                                   |                                                                |     |         |
|---------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|-----|---------|
| REF. No.                                                            | CODICE CODE                         | DESCRIZIONE                                                       | DESCRIPTION                                                    | QTY | NOTE    |
| 47                                                                  | RONDELLA SHNORR M10                 | RONDELLA DI SICUREZZA                                             | SAFETY WASHER                                                  | 24  |         |
| 48                                                                  | RONDELLA SHNORR M16                 | RONDELLA DI SICUREZZA                                             | SAFETY WASHER                                                  | 8   |         |
| 49                                                                  | J-CU18                              | GUARNIZIONE RAME 1/8"                                             | 1/8" COPPER WASHER                                             | 3   |         |
| 50                                                                  | UNI 1336 - 5 x 36                   | COPIGLIA                                                          | COTTER PIN                                                     | 1   |         |
| 51                                                                  | 71412AM8P125                        | INGRASSATORE M8                                                   | M8 LUBRICATOR                                                  | 4   |         |
| -                                                                   | J-WMHPWSWJ2-A                       | KIT CUSCINETTI MODULAR HYDRODINAMIC SWIVEL J2                     | J2 HP HYDRODINAMIC SWIVEL BEARINGS KIT                         | 1   |         |
| 36                                                                  | RNA4916                             | CUSCINETTO A RULLINI 90 x 110 x 30                                | ROLLER BEARING 90 x 110 x 30                                   | 2   | (1)     |
| 37                                                                  | SKF51118                            | CUSCINETTO A SFERE REGGISPISTA 90 x 120 x 22                      | THRUST BALL BEARING 90 x 120 x 22                              | 2   | (1)     |
| -                                                                   | J-AMHPSWJ2-B                        | KIT GUARNIZ. MODULAR HYDRODINAMIC SWIVEL J2 ARIA E SERVICE        | SEALS KIT FOR MODULAR HYDRODINAMIC SWIVEL J2 AIR AND SERVICE   | 1   |         |
| -                                                                   | J-WMHPWSWJ2-B                       | KIT GUARNIZ. MODULAR HYDRODINAMIC SWIVEL J2 ACQUA E SERVICE       | SEALS KIT FOR MODULAR HYDRODINAMIC SWIVEL J2 WATER AND SERVICE | 1   |         |
| 23                                                                  | XRB 50 61 4.2                       | GUARNIZIONE PER STELO ROTANTE D.50                                | D.50 ROTATING SEAL                                             | 2   | (1)     |
| 24                                                                  | XRB 90 101 4.2                      | GUARNIZIONE PER STELO ROTANTE D.90                                | D.90 ROTATING SEAL                                             | 3   | (1)     |
| 25                                                                  | R35-A (PRESSIONE INTERNA) 51x42x2,9 | GUARNIZIONE POLIURETANO 95 SHORE-A (PRESSIONE LATO INTERNO)       | POLIURETHANE SEAL 95 SHORE-A (INNER SIDE PRESSURE)             | 2   | (1)     |
| 26                                                                  | OR 150                              | O-RING                                                            | O-RING SEAL                                                    | 3   | (1)     |
| 27                                                                  | OR 151                              | O-RING                                                            | O-RING SEAL                                                    | 1   | (1)     |
| 28                                                                  | OR 827                              | O-RING                                                            | O-RING SEAL                                                    | 1   | (1)     |
| 29                                                                  | OR 237                              | O-RING                                                            | O-RING SEAL                                                    | 1   | (1)     |
| 30                                                                  | OR 239                              | O-RING                                                            | O-RING SEAL                                                    | 1   | (1)     |
| 31                                                                  | OR 248                              | O-RING                                                            | O-RING SEAL                                                    | 1   | (1)     |
| 32                                                                  | A 90 110 12                         | GUARNIZIONE A LABBRI ASIMMETRICI 90x110x12 POLIURETANO 93 SHORE A | 90x110x12 POLIURETHANE 93 SHORE-A LIP SEAL                     | 2   | (1) (2) |
| 33                                                                  | K35-P 44.8x51x4.5 (D-1439-A)        | GUARNIZIONE POLIURETANO 95 SHORE-A                                | POLIURETHANE SEAL 95 SHORE-A                                   | 4   | (1)     |
| 34                                                                  | K35P 111,8x118x4.5 (D-1731-20-A)    | GUARNIZIONE POLIURETANO 95 SHORE-A                                | POLIURETHANE SEAL 95 SHORE-A                                   | 1   | (1)     |
| 35                                                                  | DIN 3760 - A - 90 x 110 x 12 - NBR  | PARAOILIO SINGOLO LABBRO                                          | ONE LIP SEAL                                                   | 1   | (1)     |
| 52                                                                  | CH433354/1                          | GUARNIZIONE CH 90 x 110 x 25                                      | CH SEAL 90 x 110 x 25                                          | 2   | (1) (3) |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

(2) NON USATO PER SWIVEL CEMENTO-ACQUA J-WMHPWSWJ2 - NOT USED FOR GROUT-WATER SWIVEL J-WMHPWSWJ2

(3) NON USATO PER SWIVEL CEMENTO-ARIA J-AMHPSWJ2 - NOT USED FOR GROUT-AIR SWIVEL J-AMHPSWJ2



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno una volta al giorno (ogni 8 ore) con grasso a base di litio. Ingrassare le guarnizioni idrodinamiche almeno due volte al giorno e preferibilmente dopo ogni iniezione di cemento. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura). Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carello simile a quello della figura. Il carello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

Lubricate the roller bearings once per day (every 8h) using lithium based grease. Grease the hydrodynamic seals at least twice a day and preferably after each jet grouting injection.

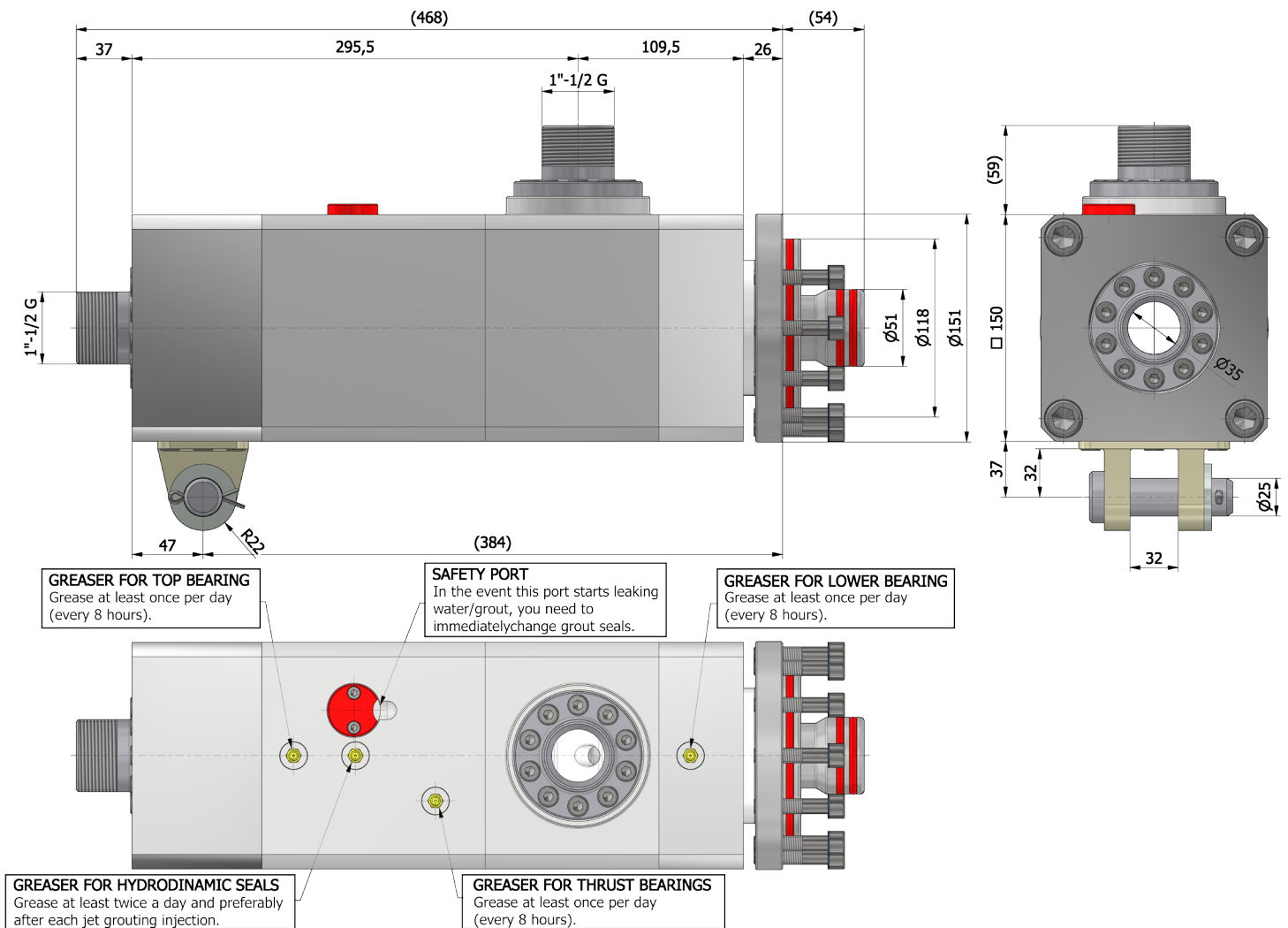
Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure). In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

| CODICE<br>CODE                                                                         | J-AMHPSWJ2                                                                                                                      | J-WMHPSWJ2                                           |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa (CEMENTO / GROUT)<br>3 MPa (ARIA / AIR)                                                                                  | 42 MPa (CEMENTO / GROUT)<br>42 MPa (ACQUA / WATER)   |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa (CEMENTO / GROUT)<br>2,4 MPa (ARIA / AIR)                                                                                | 40 MPa (CEMENTO / GROUT)<br>40 MPa (ACQUA / WATER)   |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +110 °C                                                                                                                 | -30°C / +120 °C                                      |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                                                |                                                      |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 155 RPM (*)                                                                                                                     |                                                      |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                                          |                                                      |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 30 KN                                                                                                                           |                                                      |
| MEDIA<br>MEDIUM                                                                        | 1ST INLET:<br>ACQUA E MISCELE CEMENTO-ACQUA<br>(RAPPORTO C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX<br>(RATIO G:W MAX 1,4) | 2ND INLET:<br>AIR (J-AMHPSWJ2)<br>WATER (J-WMHPSWJ2) |
| PESO<br>WEIGHT                                                                         | 53,8 KG                                                                                                                         |                                                      |

**(\*)**: Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals





## 2.23 HP SWIVEL HYDRODYNAMIC ROTATING SEALS [J-8C2TS70K]

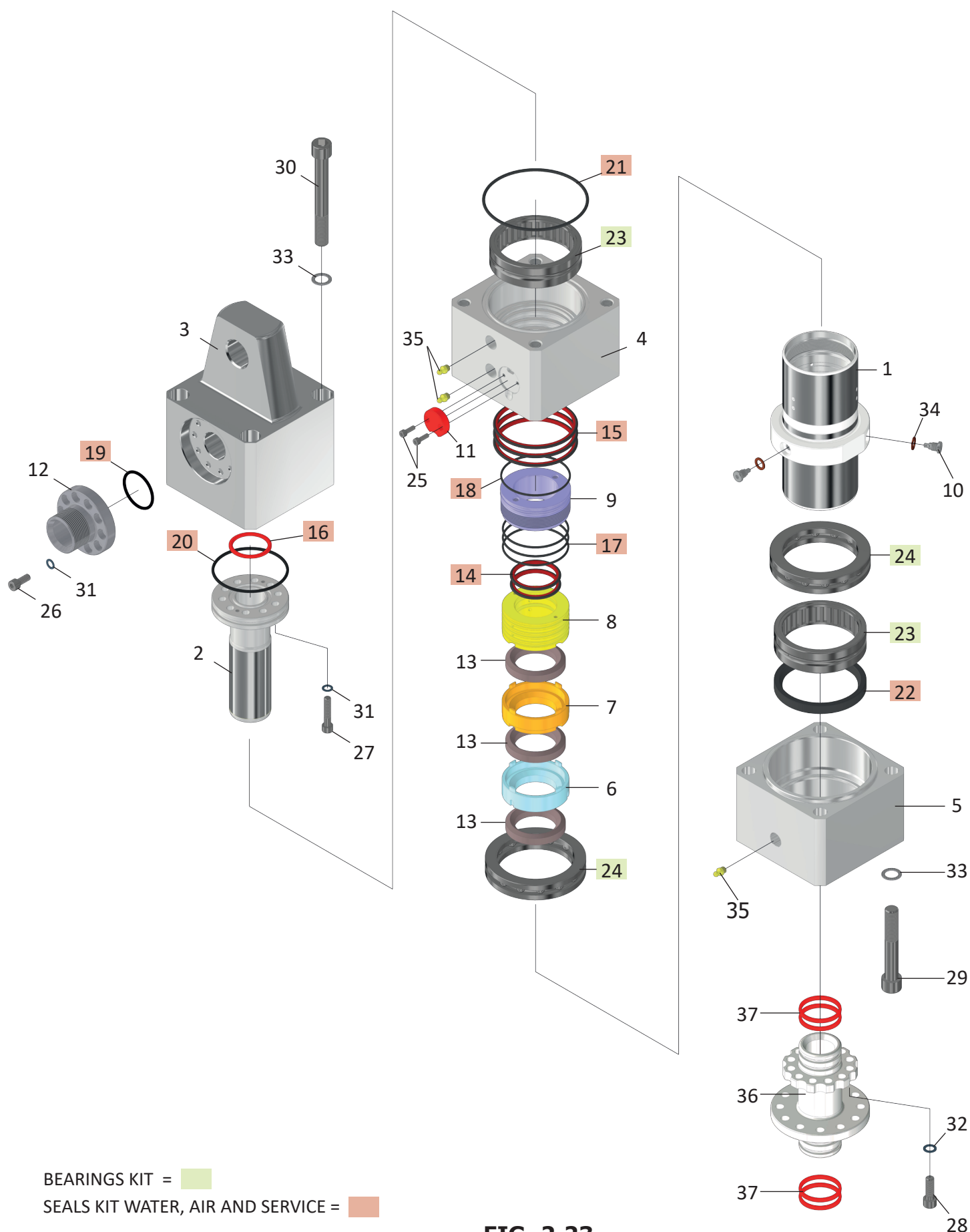


FIG. 2.23



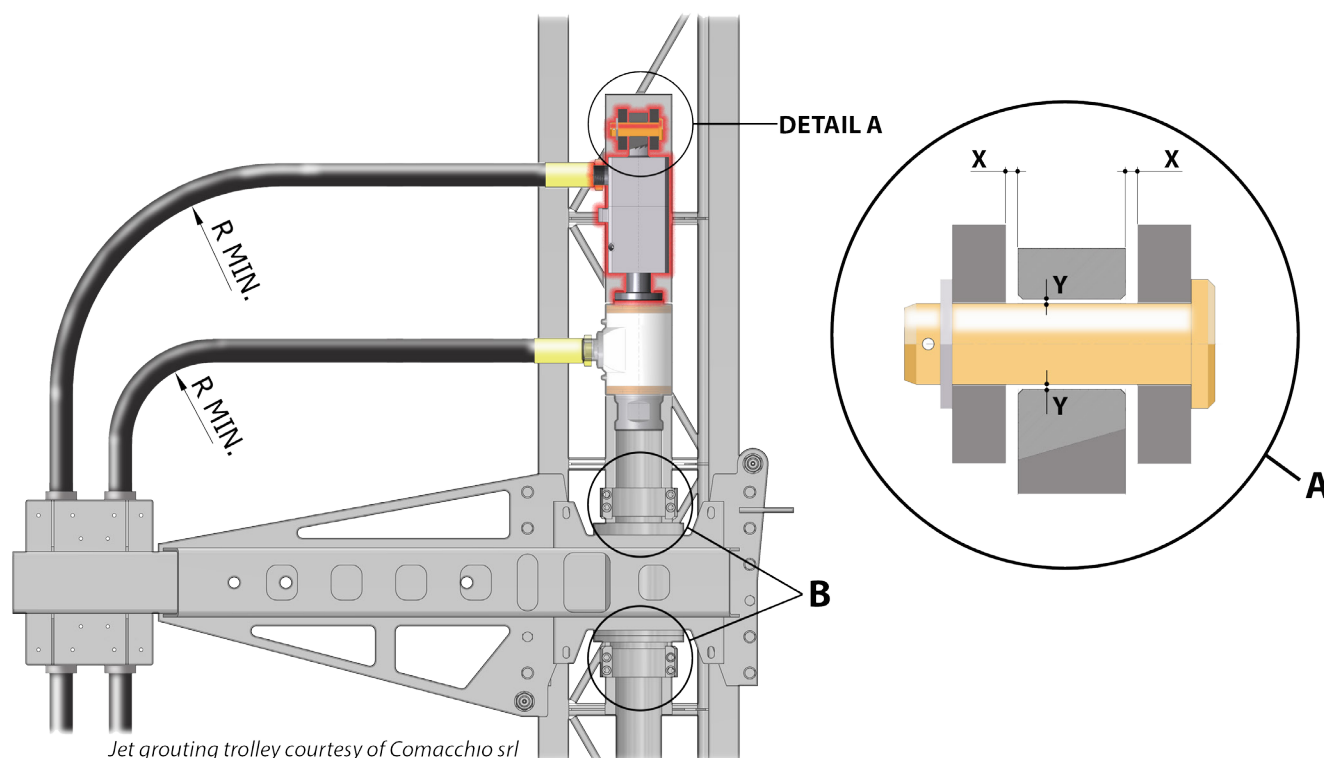
J-8C2TS70K (REF. FIG. 2.23)

| REF. No. | CODICE CODE           | DESCRIZIONE                                              | DESCRIPTION                     | QTY | NOTE |
|----------|-----------------------|----------------------------------------------------------|---------------------------------|-----|------|
| 1        | 2155-1                | ALBERO ROTANTE                                           | ROTATING SHAFT                  | 1   |      |
| 2        | 2155-2                | ALBERO INTERNO                                           | INNER SHAFT                     | 1   |      |
| 3        | 2155-3B               | CORPO SUPERIORE                                          | UPPER BODY                      | 1   |      |
| 4        | 2155-4                | CORPO CENTRALE                                           | MIDDLE BODY                     | 1   |      |
| 5        | 2155-5                | CORPO INFERIORE                                          | LOWER BODY                      | 1   |      |
| 6        | 2155-6                | DISTANZIALE PORTA-GUARNIZIONE ANTERIORE<br>602-33 KALSI  | 602-33 FRONT SEAL HOUSING       | 1   |      |
| 7        | 2155-7                | DISTANZIALE PORTA-GUARNIZIONE CENTRALE<br>602-33 KALSI   | 602-33 MIDDLE SEAL HOUSING      | 1   |      |
| 8        | 2155-8                | DISTANZIALE PORTA-GUARNIZIONE POSTERIORE<br>602-33 KALSI | 602-33 REAR SEAL HOUSING        | 1   |      |
| 9        | 2155-9                | GHIERA CHIUSURA PORTA-GUARNIZIONI                        | SEAL HOUSING CLOSING NUT        | 1   |      |
| 10       | 2155-10               | PERNO ANTIGIRO                                           | ANTI-SPIN PIN                   | 3   |      |
| 11       | 2155-11               | CALOTTA PER FORO SPIA CEMENTO                            | SAFETY PORT CUP                 | 1   |      |
| 12       | 1092-7                | ATTACCO 1"-1/2 GAS                                       | 1"-1/2 GAS INLET                | 2   |      |
| 13       | 602-33                | GUARNIZIONE KALSI Di=50 mm                               | I.D. 50 mm KALSI SEAL           | 3   |      |
| 25       | UNI 5931 - M 5 x 16   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 2   |      |
| 26       | UNI 5931 - M 8 x 20   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 10  |      |
| 27       | UNI 5931 - M 8 x 40   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 10  |      |
| 28       | UNI 5931 - M 10 x 30  | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 12  |      |
| 29       | UNI 5931 - M 16 x 100 | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 4   |      |
| 30       | UNI 5931 - M 16 x 130 | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 4   |      |
| 31       | RONDELLA SHNORR M8    | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 20  |      |
| 32       | RONDELLA SHNORR M10   | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 12  |      |
| 33       | RONDELLA SHNORR M16   | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 8   |      |
| 34       | J-CU18                | GUARNIZIONE RAME 1/8"                                    | 1/8" COPPER WASHER              | 3   |      |
| 35       | 71412AM8P125          | INGRASSATORE M8                                          | M8 LUBRICATOR                   | 3   |      |
| 36       | 2155-12               | ADATTATORE TESTA ARIA C2 J-8C212500                      | C2 AIR SWIVEL ADAPT. J-8C212500 | 1   |      |

J-8C2TS70K (REF. FIG. 2.23)

| REF. No. | CODICE CODE                         | DESCRIZIONE                                                 | DESCRIPTION                                        | QTY | NOTE |
|----------|-------------------------------------|-------------------------------------------------------------|----------------------------------------------------|-----|------|
| -        | J-8C2TS70K-A                        | KIT CUSCINETTI HYDRODINAMIC HP SWIVEL                       | HP HYDRODINAMIC SWIVEL BEARINGS KIT                | 1   |      |
| 23       | RNA4916                             | CUSCINETTO A RULLINI 90 x 110 x 30                          | ROLLER BEARING 90 x 110 x 30                       | 2   | (1)  |
| 24       | 51118                               | CUSCINETTO A SFERE REGGISPINTA 90 x 120 x 22                | THRUST BALL BEARING 90 x 120 x 22                  | 2   | (1)  |
| -        | J-8C2TS70K-B                        | KIT GUARNIZ. HP HYDRODINAMIC SWIVEL E SERVICE               | SEALS KIT HP HYDRODINAMIC SWIVEL AND SERVICE       | 1   |      |
| 14       | XRB 50 61 4.2                       | GUARNIZIONE PER STELO ROTANTE D.50                          | D.50 ROTATING SEAL                                 | 2   | (1)  |
| 15       | XRB 90 101 4.2                      | GUARNIZIONE PER STELO ROTANTE D.90                          | D.90 ROTATING SEAL                                 | 3   | (1)  |
| 16       | R35-A (PRESSIONE INTERNA) 51x42x2,9 | GUARNIZIONE POLIURETANO 95 SHORE-A (PRESSIONE LATO INTERNO) | POLIURETHANE SEAL 95 SHORE-A (INNER SIDE PRESSURE) | 1   | (1)  |
| 17       | OR 150                              | O-RING                                                      | O-RING SEAL                                        | 3   | (1)  |
| 18       | OR 151                              | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 19       | OR 827                              | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 20       | OR 237                              | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 21       | OR 248                              | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 22       | DIN 3760 - A - 90 x 110 x 12 - NBR  | PARAOILIO SINGOLO LABBRO                                    | ONE LIP SEAL                                       | 1   | (1)  |
| 37       | K35-P 44.8x51x4.5 (D-1439-A)        | GUARNIZIONE POLIURETANO 95 SHORE-A                          | POLIURETHANE SEAL 95 SHORE-A                       | 4   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



### Procedura di lavaggio dopo trattamento jet grouting:

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### Manutenzione:

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### Ancoraggio:

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### Washing procedure after jet grouting treatment:

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### Maintenance:

Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

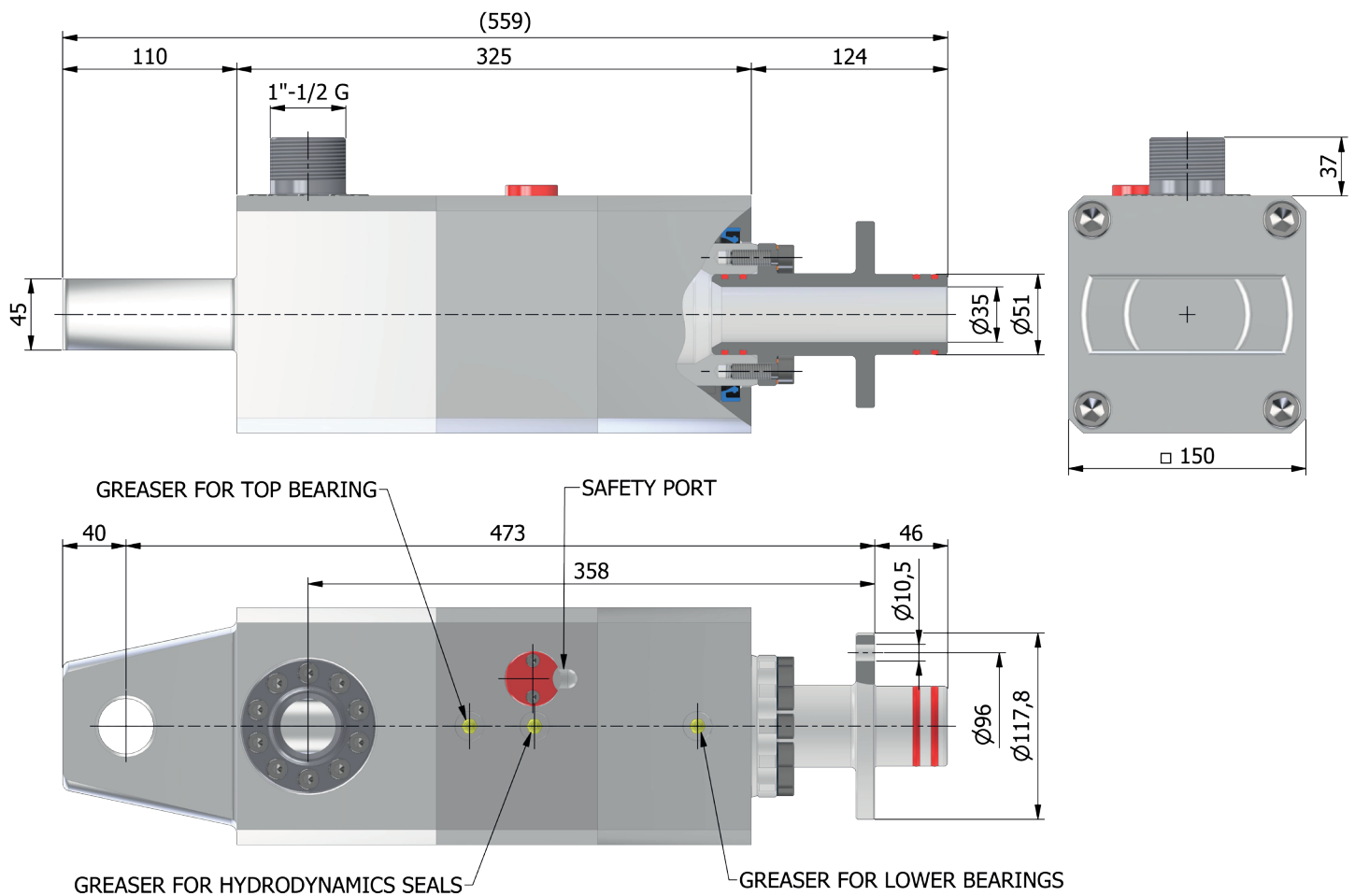
### Anchoring:

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

|                                                                                        |                                                                                                          |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8C2TS70K                                                                                               |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa                                                                                                   |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                   |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                          |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                         |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 155 RPM (*)                                                                                              |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                   |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 30 KN                                                                                                    |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPP. C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 34,1 KG                                                                                                  |

(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals



## 2.24 HP SWIVEL HYDRODYNAMIC ROTATING SEALS (VERTICAL INLET) [J-8C2TS70KV]

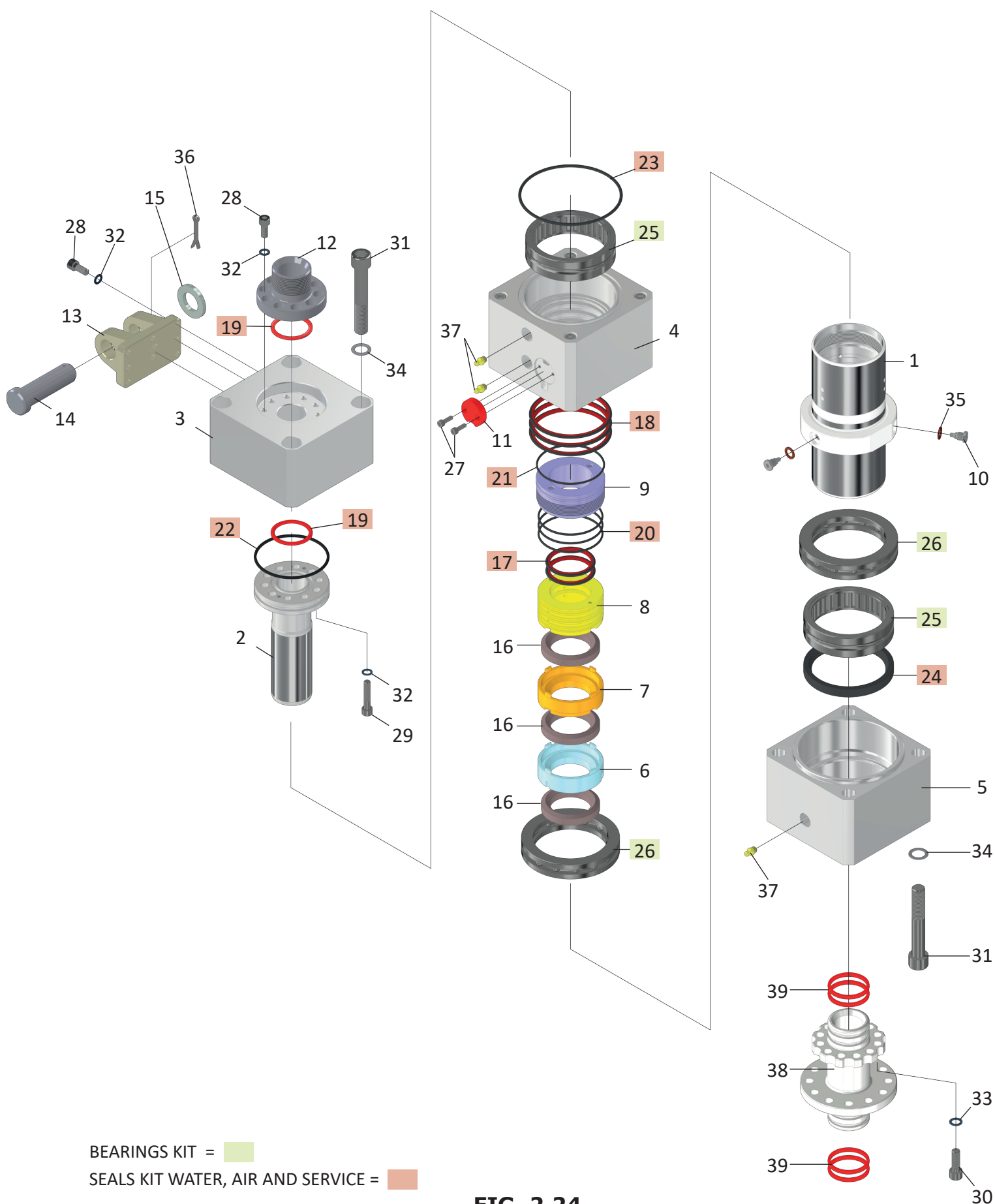


FIG. 2.24



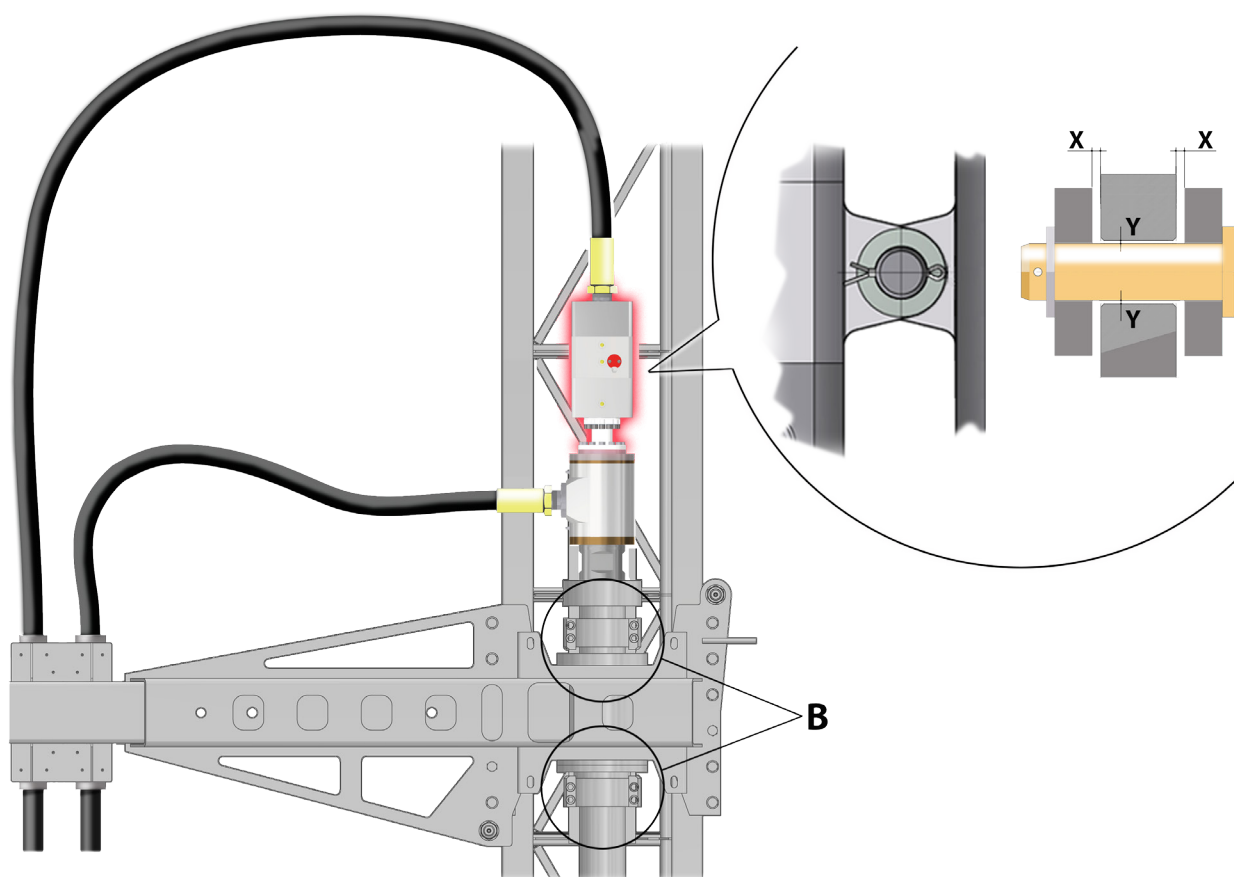
| J-8C2TS70KV (REF. FIG. 2.24) |                       |                                                          |                                 |     |      |
|------------------------------|-----------------------|----------------------------------------------------------|---------------------------------|-----|------|
| REF. No.                     | CODICE CODE           | DESCRIZIONE                                              | DESCRIPTION                     | QTY | NOTE |
| 1                            | 2155-1                | ALBERO ROTANTE                                           | ROTATING SHAFT                  | 1   |      |
| 2                            | 2155-2                | ALBERO INTERNO                                           | INNER SHAFT                     | 1   |      |
| 3                            | 2155-3                | CORPO SUPERIORE                                          | UPPER BODY                      | 1   |      |
| 4                            | 2155-4                | CORPO CENTRALE                                           | MIDDLE BODY                     | 1   |      |
| 5                            | 2155-5                | CORPO INFERIORE                                          | LOWER BODY                      | 1   |      |
| 6                            | 2155-6                | DISTANZIALE PORTA-GUARNIZIONE ANTERIORE<br>602-33 KALSI  | 602-33 FRONT SEAL HOUSING       | 1   |      |
| 7                            | 2155-7                | DISTANZIALE PORTA-GUARNIZIONE CENTRALE<br>602-33 KALSI   | 602-33 MIDDLE SEAL HOUSING      | 1   |      |
| 8                            | 2155-8                | DISTANZIALE PORTA-GUARNIZIONE POSTERIORE<br>602-33 KALSI | 602-33 REAR SEAL HOUSING        | 1   |      |
| 9                            | 2155-9                | GHIERA CHIUSURA PORTA-GUARNIZIONI                        | SEAL HOUSING CLOSING NUT        | 1   |      |
| 10                           | 2155-10               | PERNO ANTIGIRO                                           | ANTI-SPIN PIN                   | 3   |      |
| 11                           | 2155-11               | CALOTTA PER FORO SPIA CEMENTO                            | SAFETY PORT CUP                 | 1   |      |
| 12                           | 1092-7                | ATTACCO 1"-1/2 GAS                                       | 1"-1/2 GAS INLET                | 1   |      |
| 13                           | 1092-30               | STAFFA DI ATTACCO                                        | ATTACHMENT BRACKET              | 1   |      |
| 14                           | 1731-20-11            | PERNO                                                    | PIN                             | 1   |      |
| 15                           | 1731-20-12            | RONDELLA                                                 | WASHER                          | 1   |      |
| 16                           | 602-33                | GUARNIZIONE KALSI Di=50 mm                               | I.D. 50 mm KALSI SEAL           | 3   |      |
| 27                           | UNI 5931 - M 5 x 16   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 2   |      |
| 28                           | UNI 5931 - M 8 x 20   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 18  |      |
| 29                           | UNI 5931 - M 8 x 40   | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 10  |      |
| 30                           | UNI 5931 - M 10 x 30  | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 12  |      |
| 31                           | UNI 5931 - M 16 x 100 | VITE TCCE CL. 12.9                                       | CL.12.9 SOCKET HEAD SCREW       | 8   |      |
| 32                           | RONDELLA SHNORR M8    | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 28  |      |
| 33                           | RONDELLA SHNORR M10   | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 12  |      |
| 34                           | RONDELLA SHNORR M16   | RONDELLA DI SICUREZZA                                    | SAFETY WASHER                   | 8   |      |
| 35                           | J-CU18                | GUARNIZIONE RAME 1/8"                                    | 1/8" COPPER WASHER              | 3   |      |
| 36                           | UNI 1336 - 5 x 36     | COPIGLIA                                                 | COTTER PIN                      | 1   |      |
| 37                           | 71412AM8P125          | INGRASSATORE M8                                          | M8 LUBRICATOR                   | 3   |      |
| 38                           | 2155-12               | ADATTATORE TESTA ARIA C2 J-8C212500                      | C2 AIR SWIVEL ADAPT. J-8C212500 | 1   |      |

J-8C2TS70KV (REF. FIG. 2.24)

| REF. No. | CODICE CODE                            | DESCRIZIONE                                                 | DESCRIPTION                                        | QTY | NOTE |
|----------|----------------------------------------|-------------------------------------------------------------|----------------------------------------------------|-----|------|
| -        | J-8C2TS70K-A                           | KIT CUSCINETTI HYDRODINAMIC HP SWIVEL                       | HP HYDRODINAMIC SWIVEL BEARINGS KIT                | 1   |      |
| 25       | RNA4916                                | CUSCINETTO A RULLINI 90 x 110 x 30                          | ROLLER BEARING 90 x 110 x 30                       | 2   | (1)  |
| 26       | 51118                                  | CUSCINETTO A SFERE REGGISPINTA 90 x 120 x 22                | THRUST BALL BEARING 90 x 120 x 22                  | 2   | (1)  |
| -        | J-8C2TS70K-B                           | KIT GUARNIZ. HP HYDRODINAMIC SWIVEL E SERVICE               | SEALS KIT HP HYDRODINAMIC SWIVEL AND SERVICE       | 1   |      |
| 17       | XRB 50 61 4.2                          | GUARNIZIONE PER STELO ROTANTE D.50                          | D.50 ROTATING SEAL                                 | 2   | (1)  |
| 18       | XRB 90 101 4.2                         | GUARNIZIONE PER STELO ROTANTE D.90                          | D.90 ROTATING SEAL                                 | 3   | (1)  |
| 19       | R35-A (PRESSIONE INTERNA)<br>51x42x2,9 | GUARNIZIONE POLIURETANO 95 SHORE-A (PRESSIONE LATO INTERNO) | POLIURETHANE SEAL 95 SHORE-A (INNER SIDE PRESSURE) | 2   | (1)  |
| 20       | OR 150                                 | O-RING                                                      | O-RING SEAL                                        | 3   | (1)  |
| 21       | OR 151                                 | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 22       | OR 237                                 | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 23       | OR 248                                 | O-RING                                                      | O-RING SEAL                                        | 1   | (1)  |
| 24       | DIN 3760 - A - 90 x 110 x 12<br>- NBR  | PARAOLIO SINGOLO LABBRO                                     | ONE LIP SEAL                                       | 1   | (1)  |
| 39       | K35-P 44.8x51x4.5 (D-1439-A)           | GUARNIZIONE POLIURETANO 95 SHORE-A                          | POLIURETHANE SEAL 95 SHORE-A                       | 4   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY





### **Procedura di lavaggio dopo trattamento jet grouting:**

Poco prima della fine del trattamento jet grouting aprire la valvola dell'acqua e contemporaneamente chiudere la valvola del cemento senza modificare le impostazioni della pompa. Il lavaggio sarà terminato quando si verificherà una caduta di pressione.

### **Manutenzione:**

Ingrassare i cuscinetti almeno ogni 3h con grasso a base di litio. Cambiare il pacco guarnizioni quando dalla spia posta sotto l'ingresso del cemento (Safety port) si nota una perdita di cemento/acqua.

### **Ancoraggio:**

La staffa antigiro e il carrello su cui fissare la testa, devono consentire un'escursione trasversale X di almeno 5 mm e radiale Y di 2 mm (vedi figura).

Nelle applicazioni con mandrino passante si raccomanda l'utilizzo di un carrello simile a quello della figura. Il carrello prevede due guide (dett. B in figura) fissate all'asta. Eventuali carichi in trazione e spinta sono assorbiti dalle guide. Inoltre le guide hanno una funzione di centratore e minimizzano carichi radiali dovuti alla eventuale eccentricità delle aste di perforazione.

### **Washing procedure after jet grouting treatment:**

Shortly before the end of jet grouting treatment, open the water valve and at the same time close the grout valve without changing the pump settings. The washing will be completed when a pressure drop will occur.

### **Maintenance:**

Lubricate the roller bearings at least every 3h using lithium based grease. Replace the seals pack when a leakage from the safety port below the grout inlet occurs.

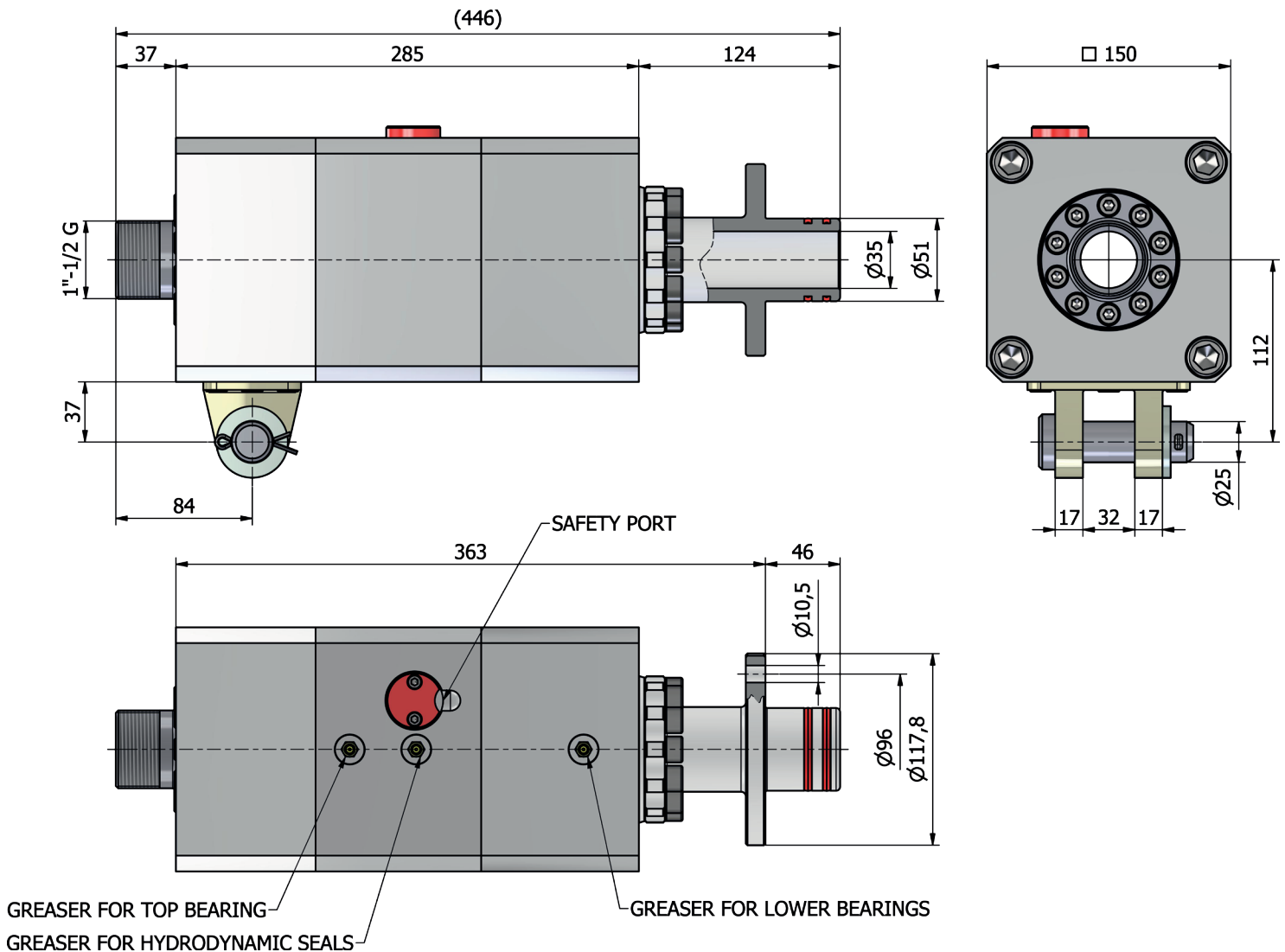
### **Anchoring:**

The anti-rotation bracket and the trolley where the swivel is locked must allow a transversal X gap of 5 mm at least and a Y radial gap of 2 mm (see the figure).

In the hollow clamp application it is recommended the use of a trolley similar to the one shown in the figure. The trolley has two guides (detail B in the figure) fixed on the rod. Any thrust and pull loads are supported by these guides. Furthermore these guides have a centering function and reduce the radial loads caused by the eventual eccentricity of the drilling rods.

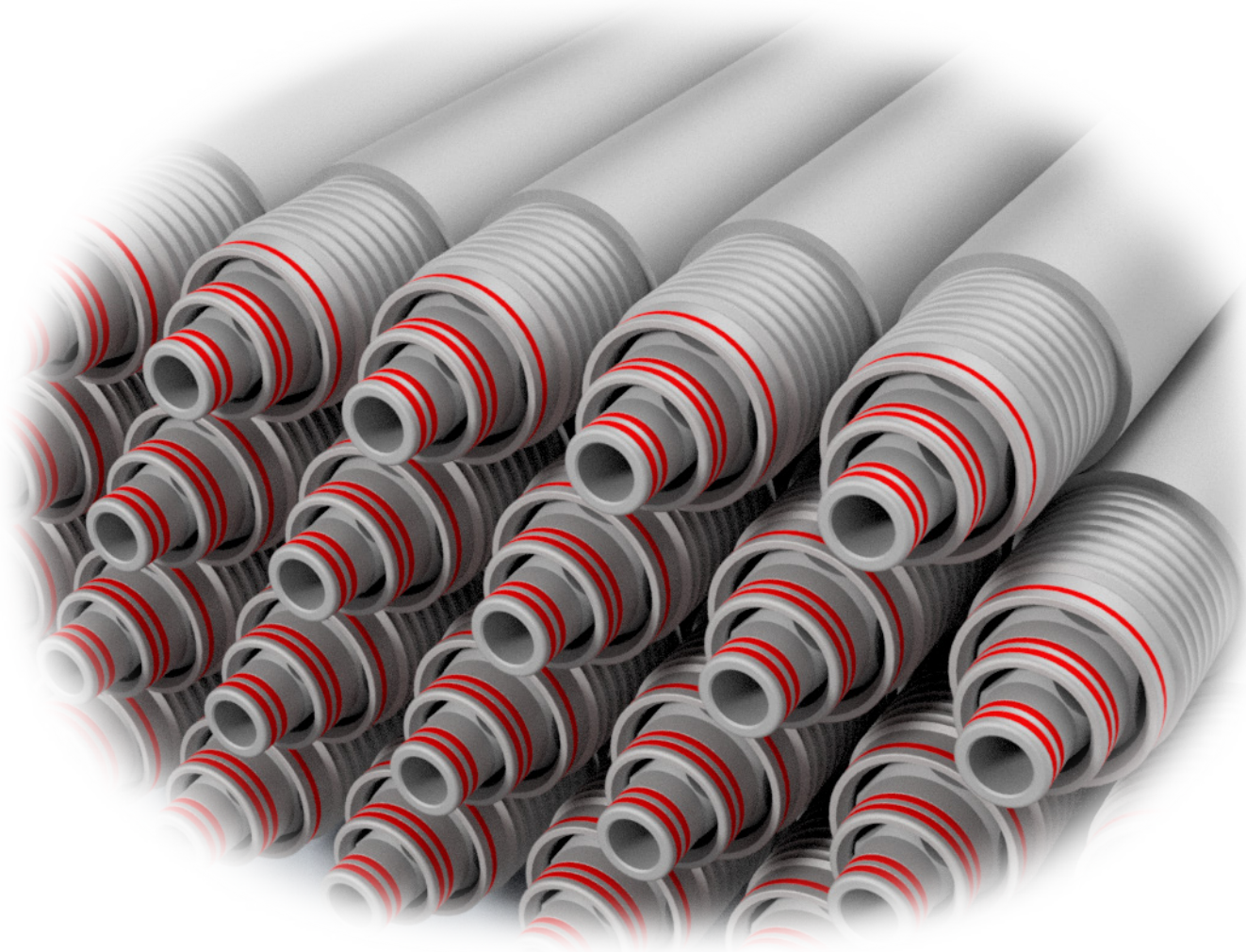
|                                                                                        |                                                                                                          |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| CODICE<br>CODE                                                                         | J-8C2TS70KV                                                                                              |
| PRESSIONE MASSIMA<br>MAX PRESSURE                                                      | 42 MPa                                                                                                   |
| PRESSIONE DI ESERCIZIO<br>WORKING PRESSURE                                             | 40 MPa                                                                                                   |
| TEMPERATURA<br>TEMPERATURE MIN-MAX                                                     | -30°C / +120 °C                                                                                          |
| VELOCITA' MASSIMA A SECCO IN PERFORAZIONE<br>MAX DRILLING SPEED DRY RUN                | 30 RPM (MAX 2 h)                                                                                         |
| VELOCITA' MASSIMA CON REFRIGERAZIONE IN PERFORAZIONE<br>MAX DRILLING SPEED WITH MEDIUM | 155 RPM (*)                                                                                              |
| VELOCITA' MASSIMA DURANTE JET GROUTING<br>MAX JET GROUTING SPEED                       | 15 RPM                                                                                                   |
| TRAZIONE-SPINTA MASSIMA APPLICABILE<br>MAX THRUST-PULL                                 | 30 KN                                                                                                    |
| MEDIA<br>MEDIUM                                                                        | ACQUA E MISCELE CEMENTO-ACQUA (RAPP. C:A NON OLTRE 1,4)<br>WATER AND GROUT-WATER MIX (RATIO G:W MAX 1,4) |
| PESO<br>WEIGHT                                                                         | 31,3 KG                                                                                                  |

(\*): Rispettare gli intervalli di ingrassaggio - Take care to greasing intervals





### 3 ASTE - RODS



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### 3.1 D.60 JET ROD

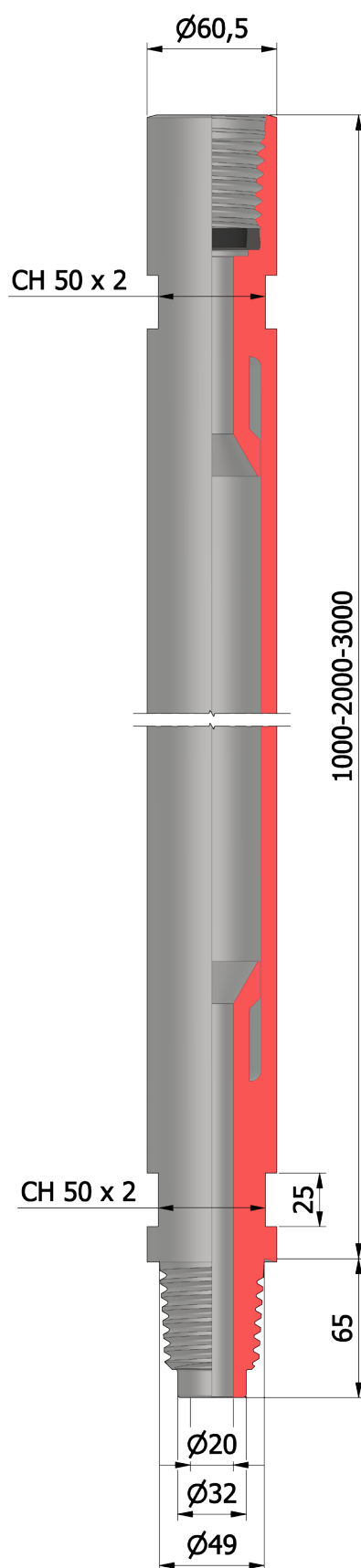


FIG. 3.1

D.60 JET ROD (REF. FIG. 3.1)

| REF. No. | CODICE CODE | DESCRIZIONE                   | DESCRIPTION            | QTY | NOTE |
|----------|-------------|-------------------------------|------------------------|-----|------|
| -        | J-60J13000  | ASTA D.60 JET L=3000          | D.60 JET ROD L=3000    | -   |      |
| -        | J-60J12000  | ASTA D.60 JET L=2000          | D.60 JET ROD L=2000    | -   |      |
| -        | J-60J11000  | ASTA D.60 JET L=1000          | D.60 JET ROD L=1000    | -   |      |
| -        | J-60J13011  | KIT GUARNIZIONI ASTA D.60 JET | D.60 JET ROD SEALS KIT | -   |      |

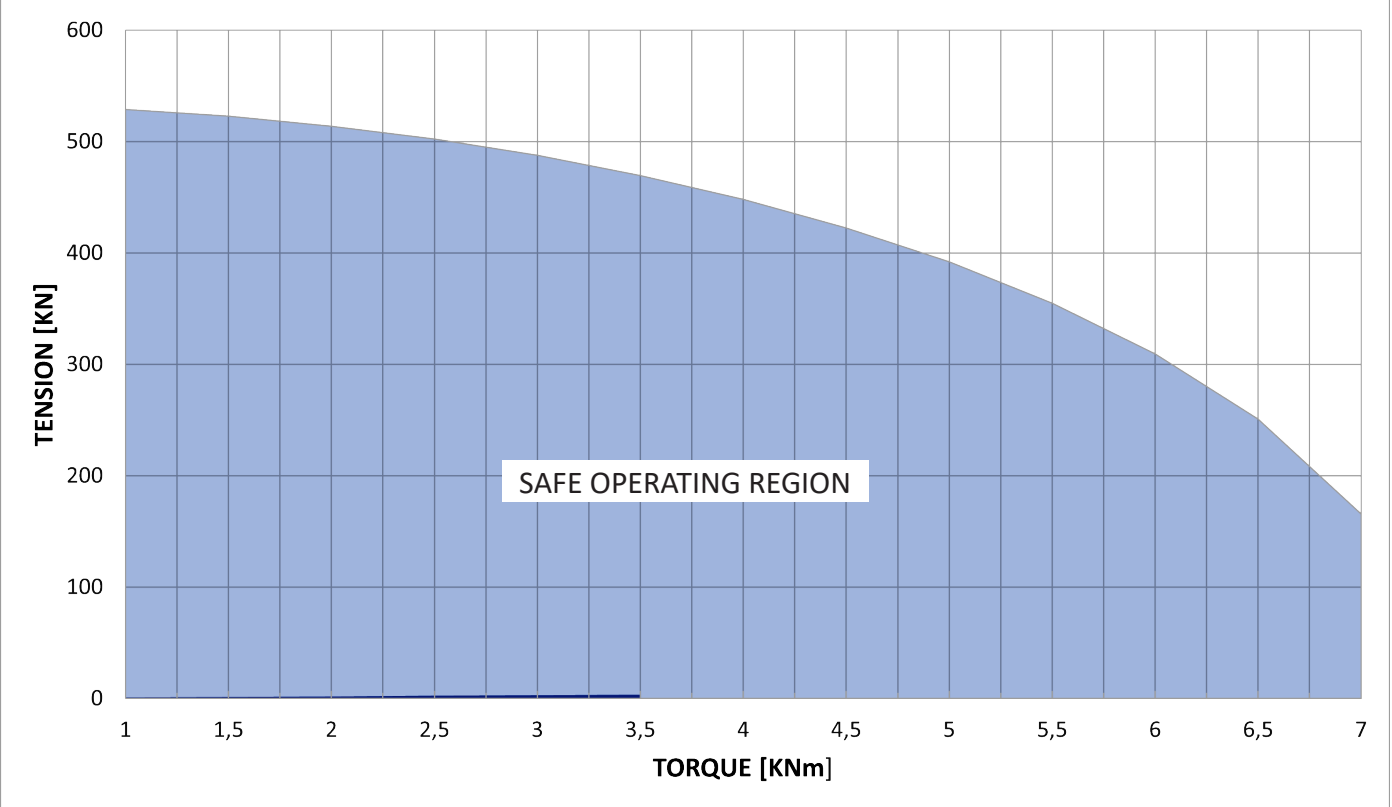
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 7,1                                 |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 7                                   |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 4,2                                 |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 530                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 20                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 12 [L=1m]<br>21 [L=2m]<br>31 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 56                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH





### 3.2 D.76 JET ROD

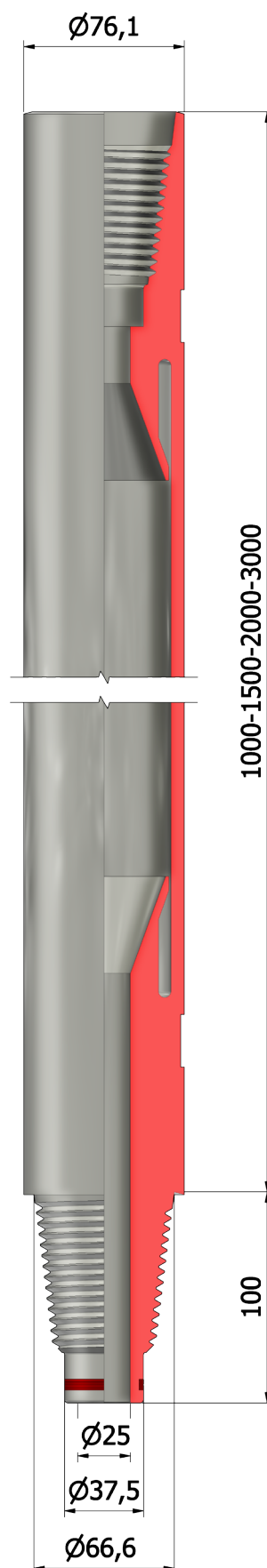


FIG. 3.2

D.76 JET ROD (REF. FIG. 3.2)

| REF. No. | CODICE CODE | DESCRIZIONE                   | DESCRIPTION            | QTY | NOTE |
|----------|-------------|-------------------------------|------------------------|-----|------|
| -        | J-76J13000  | ASTA D.76 JET L=3000          | D.76 JET ROD L=3000    | -   |      |
| -        | J-76J12000  | ASTA D.76 JET L=2000          | D.76 JET ROD L=2000    | -   |      |
| -        | J-76J11500  | ASTA D.76 JET L=1500          | D.76 JET ROD L=1500    | -   |      |
| -        | J-76J11000  | ASTA D.76 JET L=1000          | D.76 JET ROD L=1000    | -   |      |
| -        | J-76J13011  | KIT GUARNIZIONI ASTA D.76 JET | D.76 JET ROD SEALS KIT | -   |      |

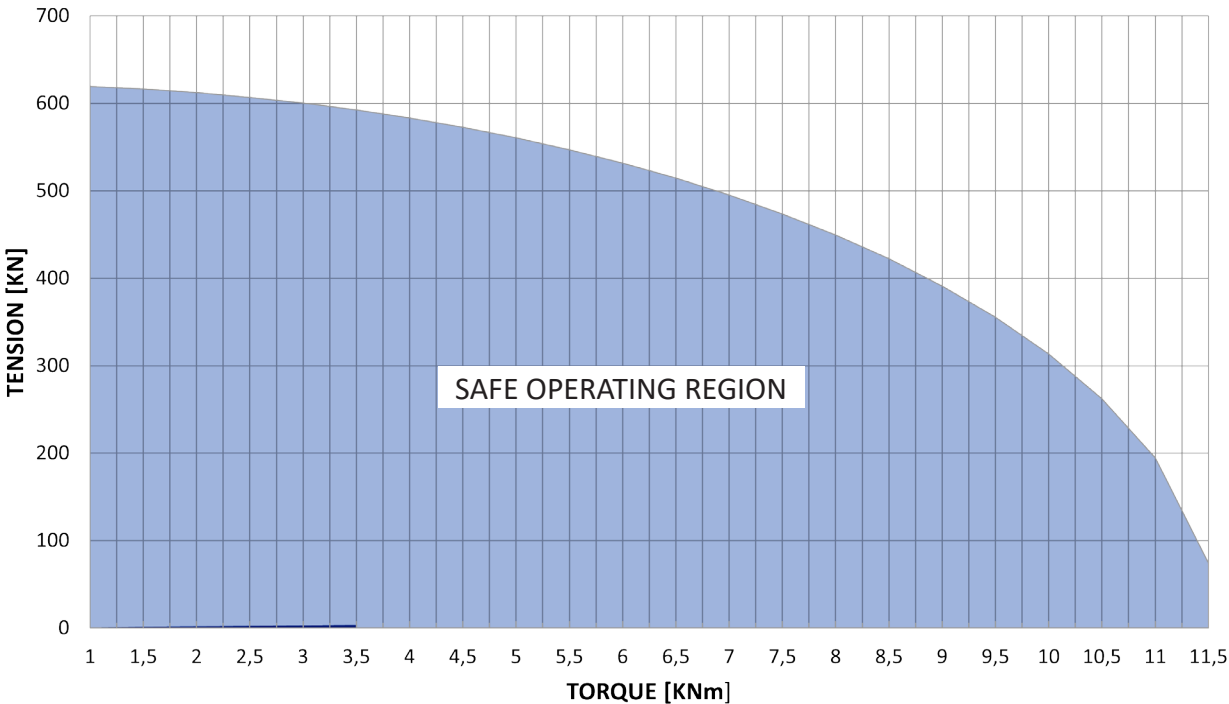
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                                    |
|---------------------------------------------------------------------------------------------------|------|-------|----------------------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                                |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                                 |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 11,5                                               |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 6,9                                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 610                                                |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 25                                                 |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 16 [L=1m]<br>22 [L=1,5m]<br>27 [L=2m]<br>38 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 72                                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH





### 3.3 D.90 JET ROD

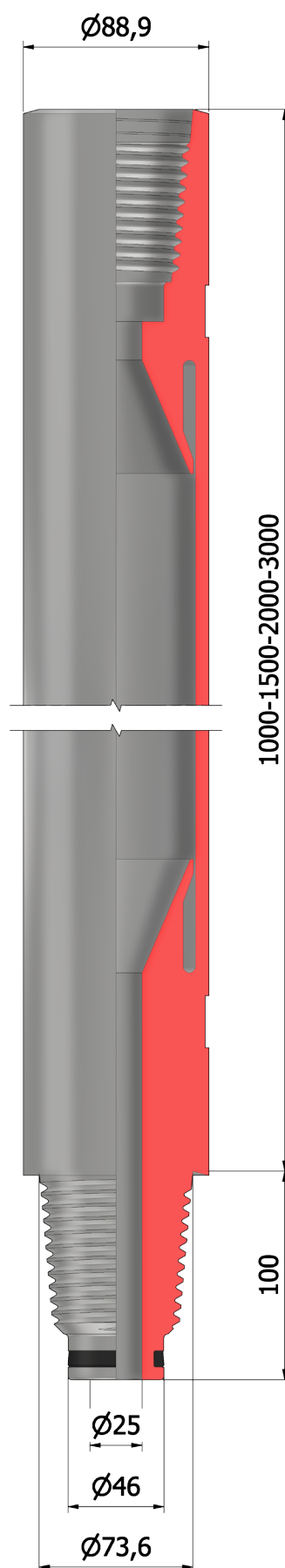


FIG. 3.3

D.90 JET ROD (REF. FIG. 3.3)

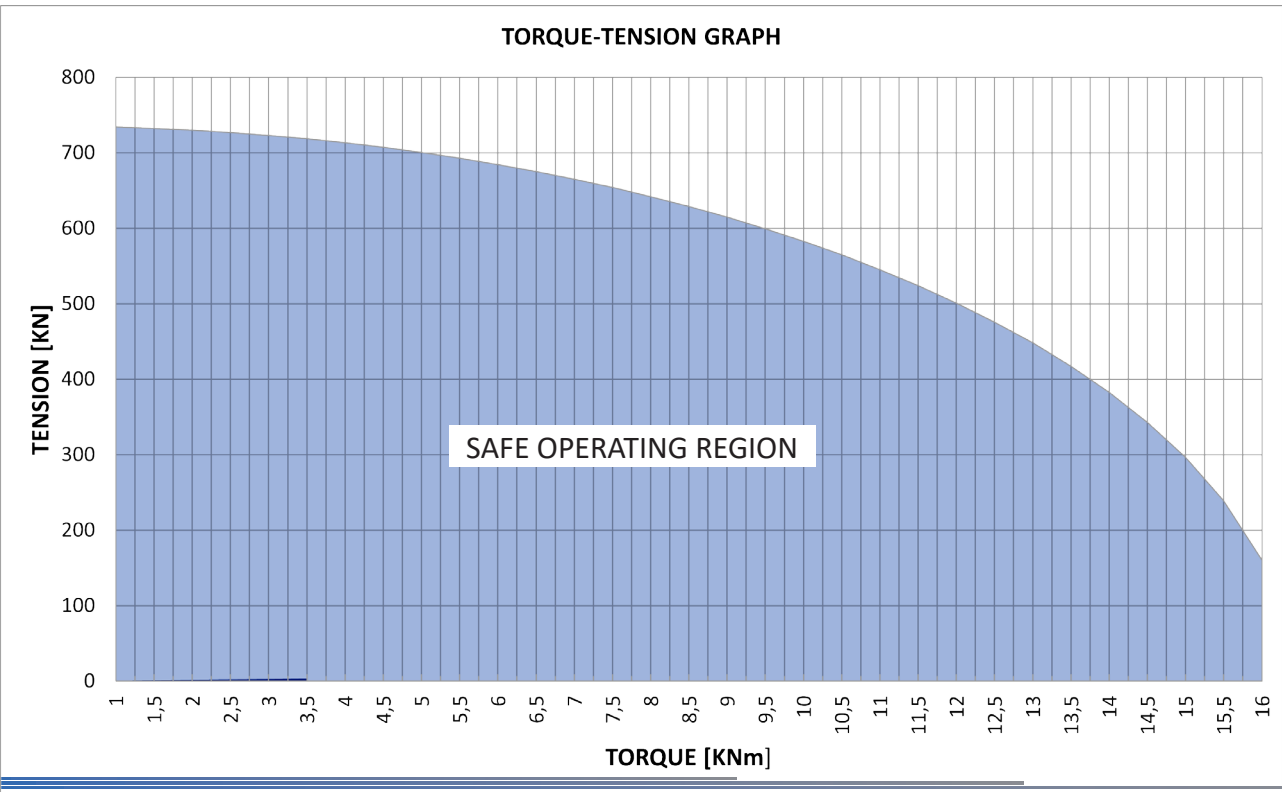
| REF. No. | CODICE CODE | DESCRIZIONE                   | DESCRIPTION            | QTY | NOTE |
|----------|-------------|-------------------------------|------------------------|-----|------|
| -        | J-889K3000  | ASTA D.90 JET L=3000          | D.90 JET ROD L=3000    | -   |      |
| -        | J-889K2000  | ASTA D.90 JET L=2000          | D.90 JET ROD L=2000    | -   |      |
| -        | J-889K1500  | ASTA D.90 JET L=1500          | D.90 JET ROD L=1500    | -   |      |
| -        | J-889K1000  | ASTA D.90 JET L=1000          | D.90 JET ROD L=1000    | -   |      |
| -        | J-889K3011  | KIT GUARNIZIONI ASTA D.90 JET | D.90 JET ROD SEALS KIT | -   |      |

MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                                    |
|---------------------------------------------------------------------------------------------------|------|-------|----------------------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                                |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                                 |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 16                                                 |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 9,6                                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 730                                                |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 30                                                 |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 21 [L=1m]<br>28 [L=1,5m]<br>34 [L=2m]<br>47 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 84                                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.



### 3.4 D.90 JET RP ROD

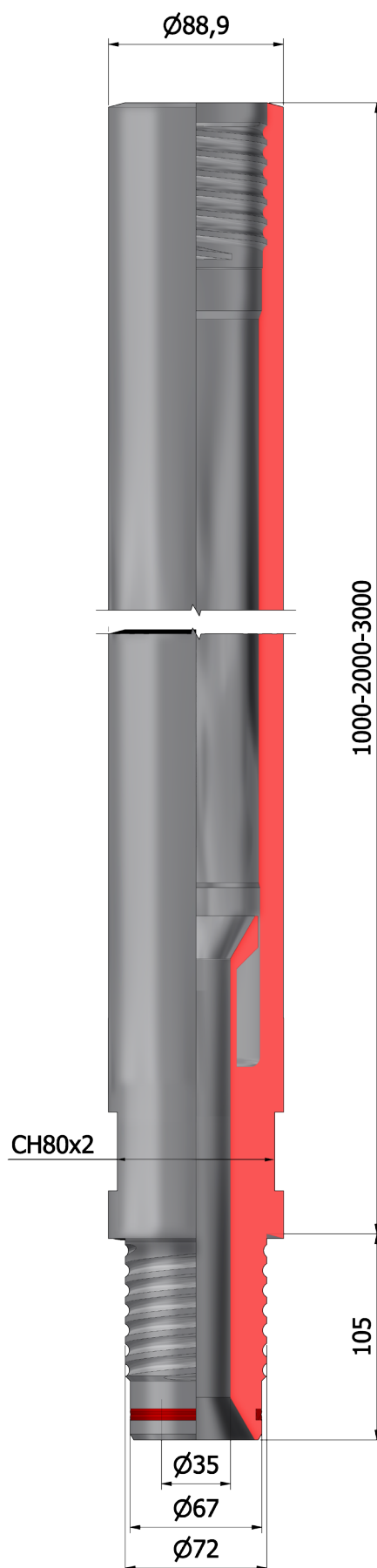


FIG. 3.4

D.90 JET RP ROD (REF. FIG. 3.4)

| REF. No. | CODICE CODE | DESCRIZIONE                      | DESCRIPTION               | QTY | NOTE |
|----------|-------------|----------------------------------|---------------------------|-----|------|
| -        | J-8JRP3000  | ASTA D.90 JET RP L=3000          | D.90 JET RP ROD L=3000    | -   |      |
| -        | J-8JRP2000  | ASTA D.90 JET RP L=2000          | D.90 JET RP ROD L=2000    | -   |      |
| -        | J-8JRP1000  | ASTA D.90 JET RP L=1000          | D.90 JET RP ROD L=1000    | -   |      |
| -        | J-8JRP3001  | KIT GUARNIZIONI ASTA D.90 JET RP | D.90 JET RP ROD SEALS KIT | -   |      |

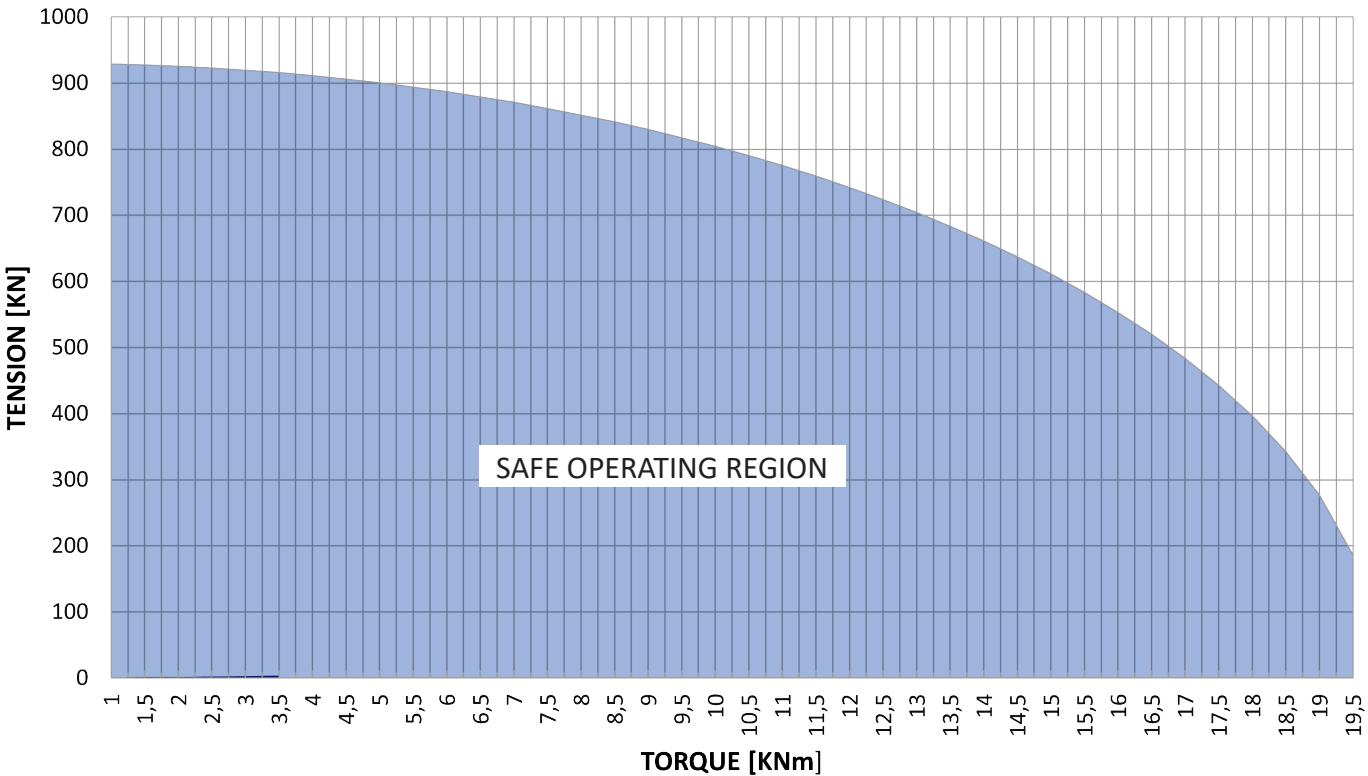
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 12,5                                |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 19,5                                |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 11,7                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 929                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 30                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 27 [L=1m]<br>50 [L=2m]<br>73 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 80                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH



### 3.5 D.114 JET ROD

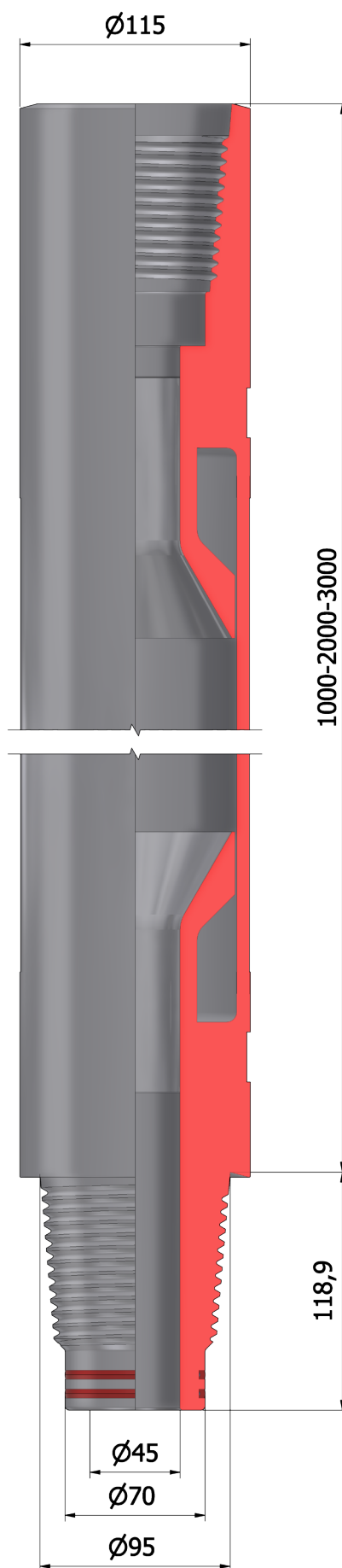


FIG. 3.5

D.114 JET ROD (REF. FIG. 3.5)

| REF. No. | CODICE CODE | DESCRIZIONE                    | DESCRIPTION             | QTY | NOTE |
|----------|-------------|--------------------------------|-------------------------|-----|------|
| -        | J-114K3000  | ASTA D.114 JET L=3000          | D.114 JET ROD L=3000    | -   |      |
| -        | J-114K2000  | ASTA D.114 JET L=2000          | D.114 JET ROD L=2000    | -   |      |
| -        | J-114K1000  | ASTA D.114 JET L=1000          | D.114 JET ROD L=1000    | -   |      |
| -        | J-114K3011  | KIT GUARNIZIONI ASTA D.114 JET | D.114 JET ROD SEALS KIT | -   |      |

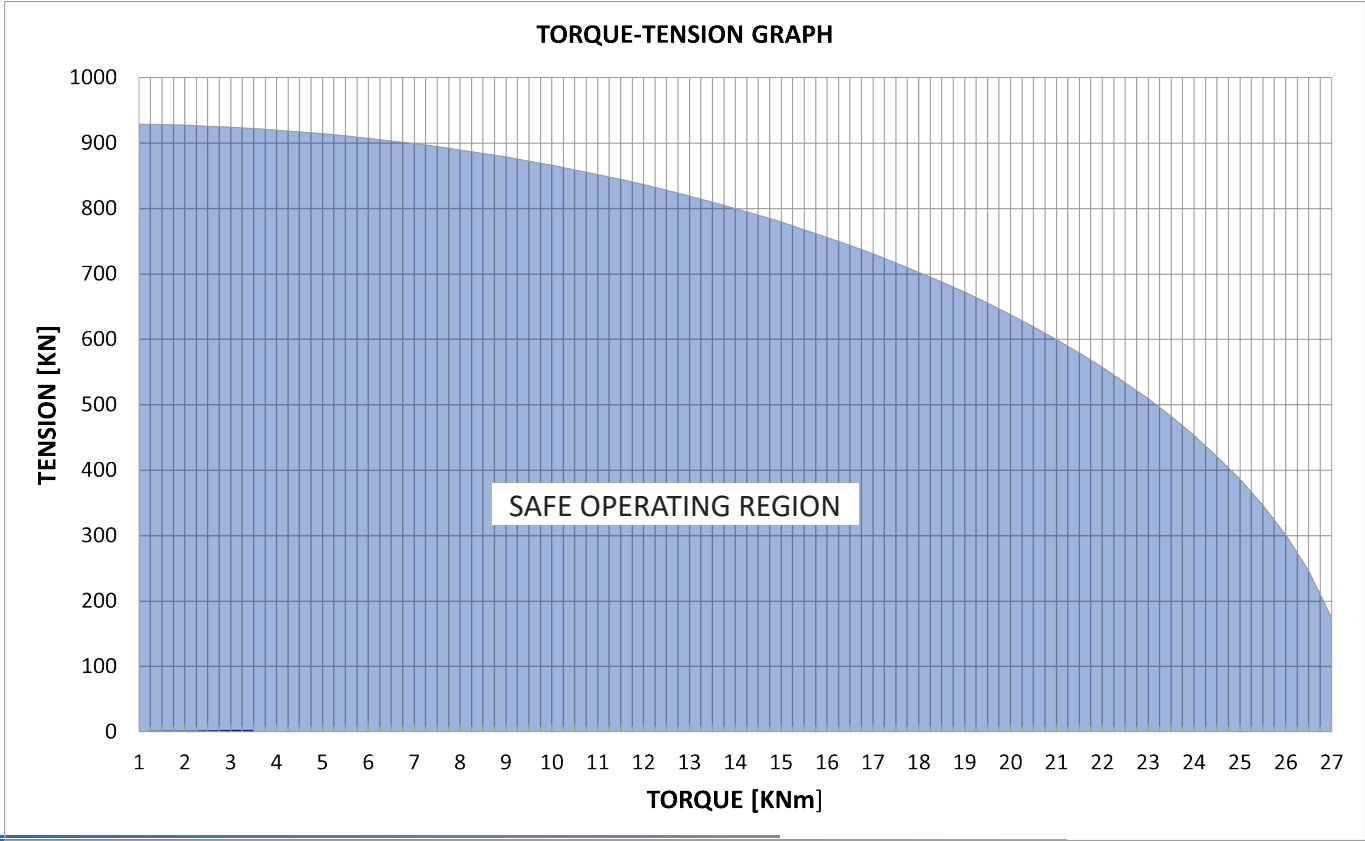
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                 |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27                                  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16                                  |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 930                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 33 [L=1m]<br>50 [L=2m]<br>67 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH





### 3.6 D.114 JET RP ROD

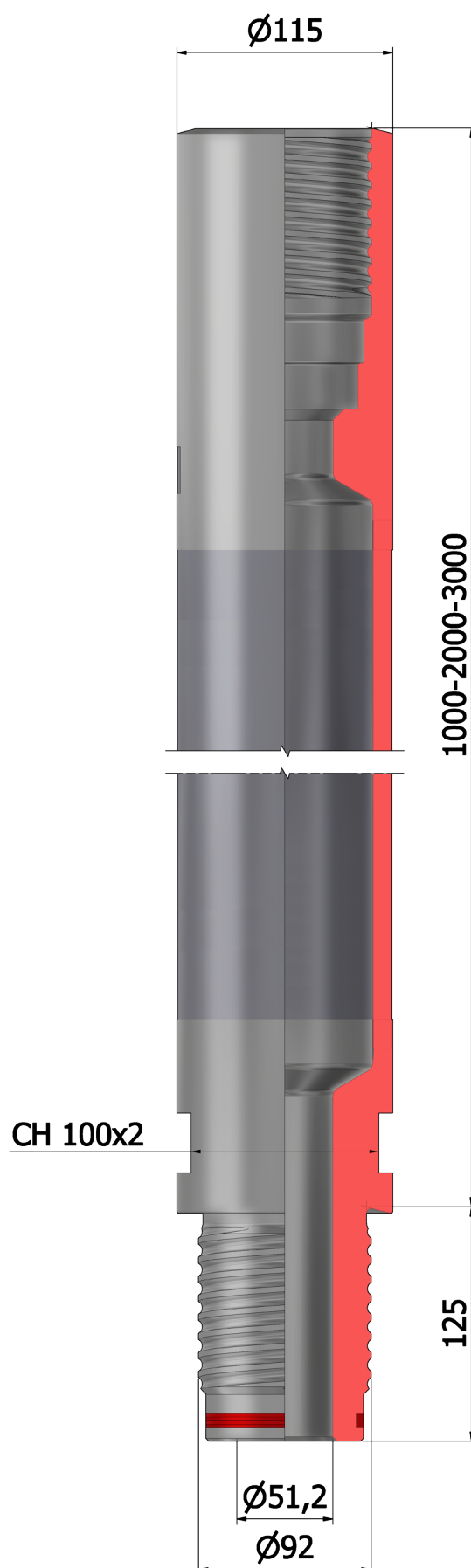


FIG. 3.6

D.114 JET RP ROD (REF. FIG. 3.6)

| REF. No. | CODICE CODE | DESCRIZIONE                       | DESCRIPTION                | QTY | NOTE |
|----------|-------------|-----------------------------------|----------------------------|-----|------|
| -        | J-11JRP300  | ASTA D.114 JET RP L=3000          | D.114 JET RP ROD L=3000    | -   |      |
| -        | J-11JRP200  | ASTA D.114 JET RP L=2000          | D.114 JET RP ROD L=2000    | -   |      |
| -        | J-11JRP100  | ASTA D.114 JET RP L=1000          | D.114 JET RP ROD L=1000    | -   |      |
| -        | J-11JRP311  | KIT GUARNIZIONI ASTA D.114 JET RP | D.114 JET RP ROD SEALS KIT | -   |      |

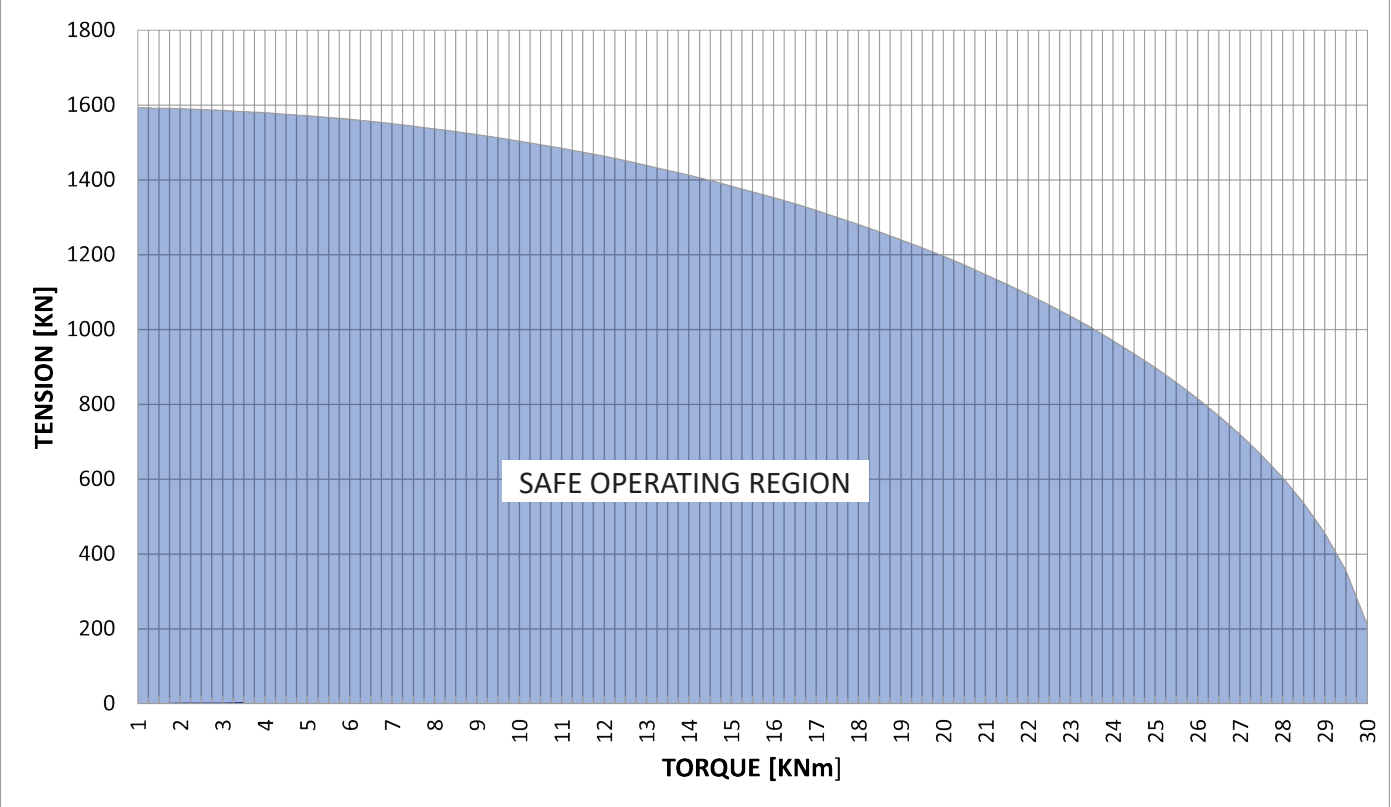
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                       |
|---------------------------------------------------------------------------------------------------|------|-------|---------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 10                                    |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 40                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 30                                    |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 18                                    |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1590                                  |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                    |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 36 [L=1m]<br>62 [L=2m]<br>87,5 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 107                                   |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH



### 3.7 D.114 JET RP ROD FOR TUNNELLING

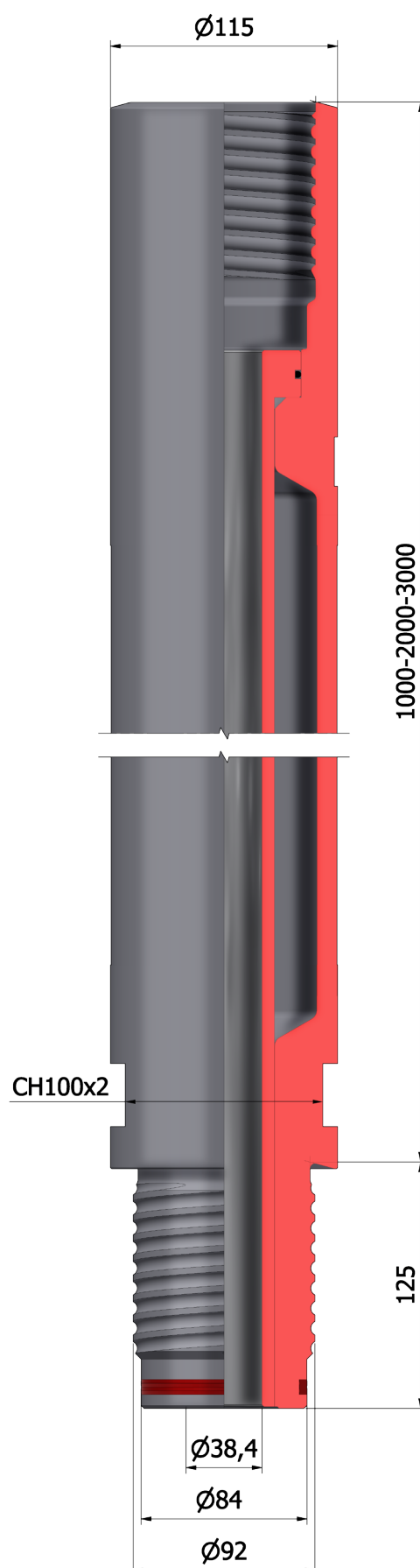


FIG. 3.7

D.114 JET RP ROD FOR TUNNELLING (REF. FIG. 3.7)

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION                   | QTY | NOTE |
|----------|--------------|-------------------------------------|-------------------------------|-----|------|
| -        | J-11JRP300-O | ASTA D.114 JET RP TUNNELLING L=3000 | D.114 JET RP ROD TUNN. L=3000 | -   |      |
| -        | J-11JRP200-O | ASTA D.114 JET RP TUNNELLING L=2000 | D.114 JET RP ROD TUNN. L=2000 | -   |      |
| -        | J-11JRP100-O | ASTA D.114 JET RP TUNNELLING L=1000 | D.114 JET RP ROD TUNN. L=1000 | -   |      |
| -        | J-11JRP311   | KIT GUARNIZIONI ASTA D.114 JET RP   | D.114 JET RP ROD SEALS KIT    | -   |      |

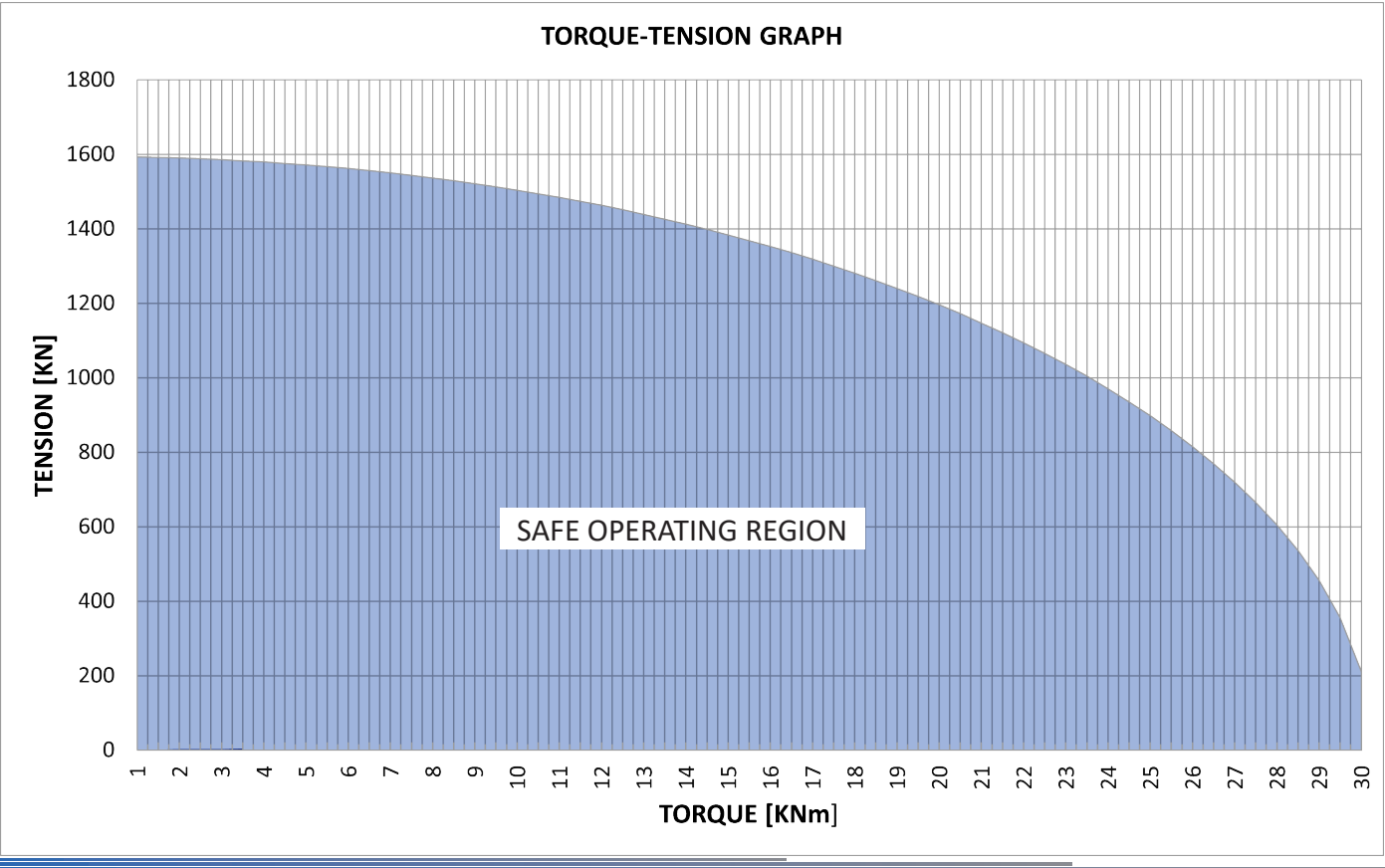
MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)

|                                                                                                   |      |       |                                        |
|---------------------------------------------------------------------------------------------------|------|-------|----------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 10                                     |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 56                                     |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 30                                     |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 18                                     |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1590                                   |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                     |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 43 [L=1m]<br>76 [L=2m]<br>109,5 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 107                                    |

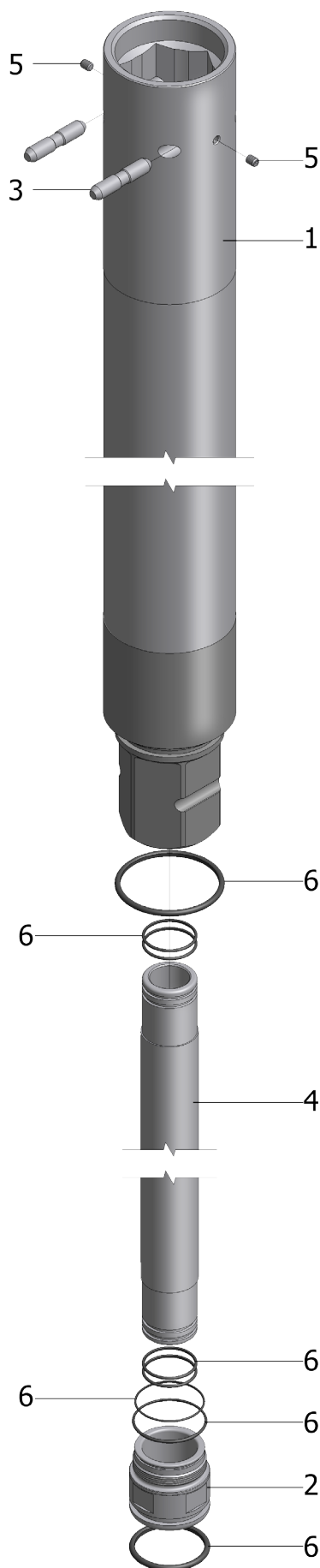
(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

TORQUE-TENSION GRAPH



### 3.8 D.114 HEX 80 JET ROD



**FIG. 3.8**

**D.114 HEX 80 JET ROD: J-EJET1000 (L=1000); J-EJET2000 (L=2000); J-EJET3000 (L=3000) (REF. FIG. 3.8)**

| REF. No. | CODICE CODE        | DESCRIZIONE                 | DESCRIPTION            | QTY | NOTE |
|----------|--------------------|-----------------------------|------------------------|-----|------|
| 1        | D-1534-1X          | ASTA ESTERNA D.114 HEX80J   | EXT. ROD D.114 HEX80J  | 1   | (1)  |
| 2        | D-1534-1-3         | MANICOTTINO ANTERIORE       | FRONT COUPLING         | 1   |      |
| 3        | D-1383-1-4         | PERNO BLOCCO ASTE           | LOCKING PIN            | 2   |      |
| 4        | D-1534-1-Y         | TUBO INTERNO ASTA HEX80J    | HEX80J INNER PIPE      | 1   | (2)  |
| 5        | 5925M8X10P125H45GR | GRANO PUNTA CIL. UNI 5925   | UNI 5925 LOCKING SCREW | 2   |      |
| 6        | J-EJET3011         | KIT GUARNIZIONI ASTA HEX80J | HEX80J ROD SEALS KIT   | 1   | (3)  |

(1) L=1000, X=FB; L=2000 X=FA; L=3000 X=F

(2) L=1000 Y=7; L=2000 Y=6; L=3000 Y=5

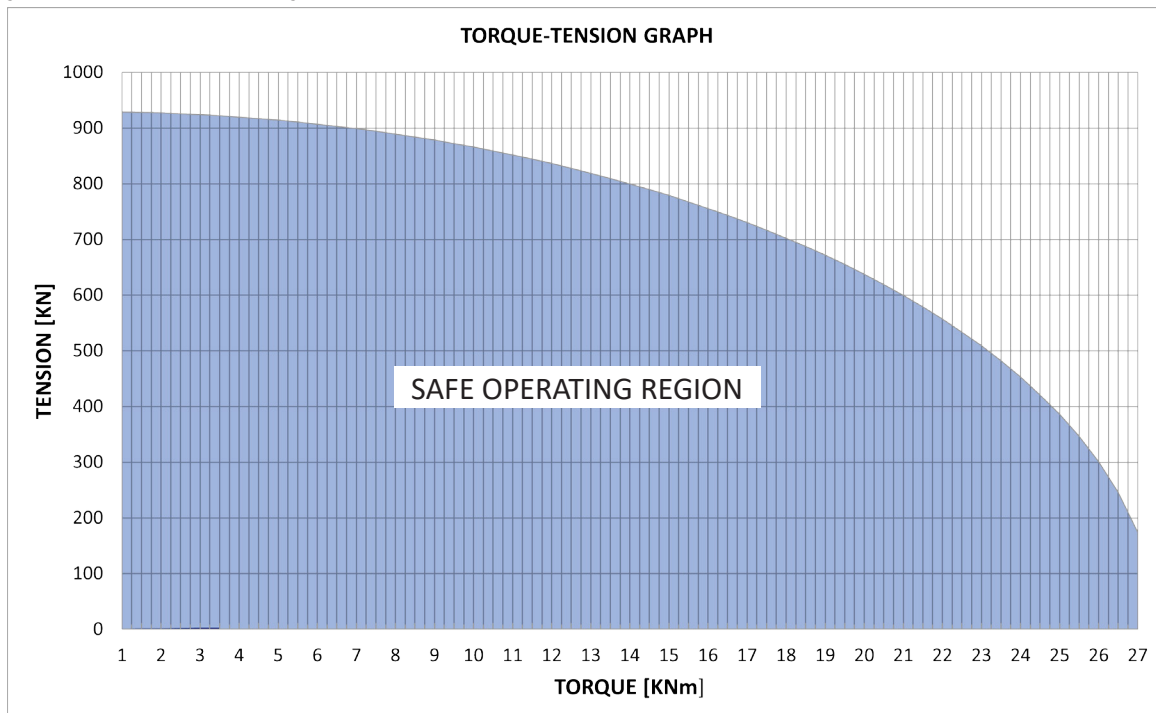
(3) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

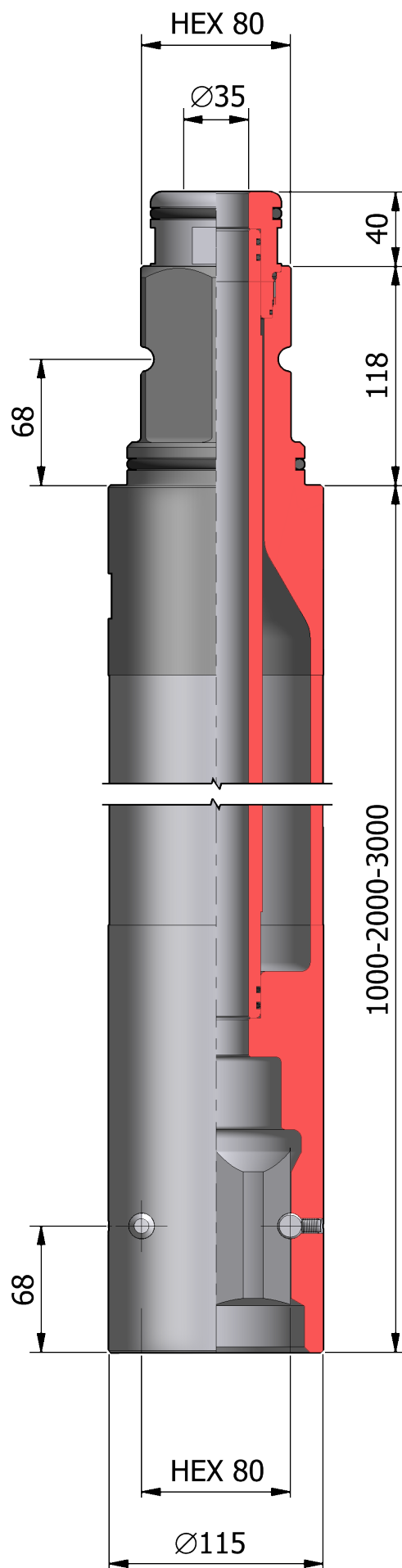
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                 |
| PRESSIONE MAX<br>MAX PRESSURE                                                                     |      | [MPa] | 56                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27                                  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | N.A.                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 930                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 37 [L=1m]<br>62 [L=2m]<br>87 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

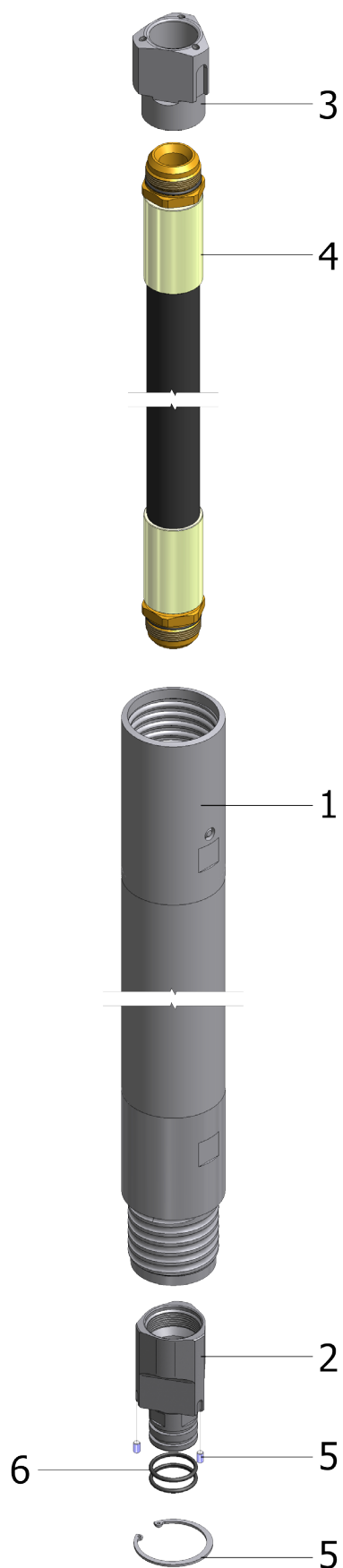




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### 3.9 D.90 C2 ROD (INNER RUBBER HOSE)



**FIG. 3.9**

**D.90 C2 ROD (INNER RUBBER HOSE): J-8C214100 (L=1000); J-8C214150 (L=1500); J-8C214200 (L=2000); J-8C214300 (L=3000) (REF. FIG. 3.9)**

| REF. No. | CODICE CODE   | DESCRIZIONE                    | DESCRIPTION                 | QTY | NOTE |
|----------|---------------|--------------------------------|-----------------------------|-----|------|
| 1        | J-8C214XX1    | TUBO ESTERNO D.90x1000 C2      | D.90x1000 C2 EXTERNAL ROD   | 1   | (1)  |
| 2        | J-8C214305    | MANICOTTO MASCHIO INT. D.90 C2 | MALE INNER COUPLING D.90 C2 | 1   |      |
| 3        | J-8C214304    | MANICOTTO FEMMINA INT. D.90 C2 | FEM. INNER COUPLING D.90 C2 | 1   |      |
| 4        | J-8C214309-XX | TUBO A.P. 1"-1/4               | 1"-1/4 H.P. HOSE            | 1   |      |
| 5        | J-8C214377    | KIT ASSEMBLAGGIO ASTA          | ROD ASSEMBLY KIT            | 1   |      |
| 6        | J-8C214311    | KIT GUARNIZIONI ASTA D.90 C2   | D.90 C2 ROD SEALS KIT       | 1   |      |

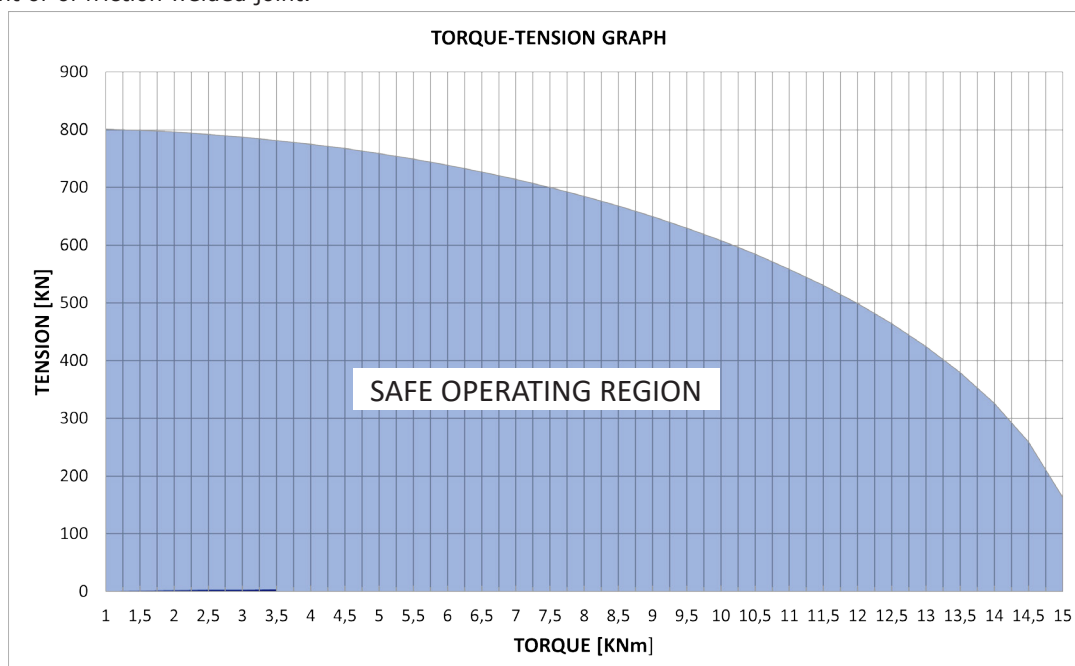
(1) L=1000 XX=10; L=1500 XX=15; L=2000 XX=20; L=3000 XX=30

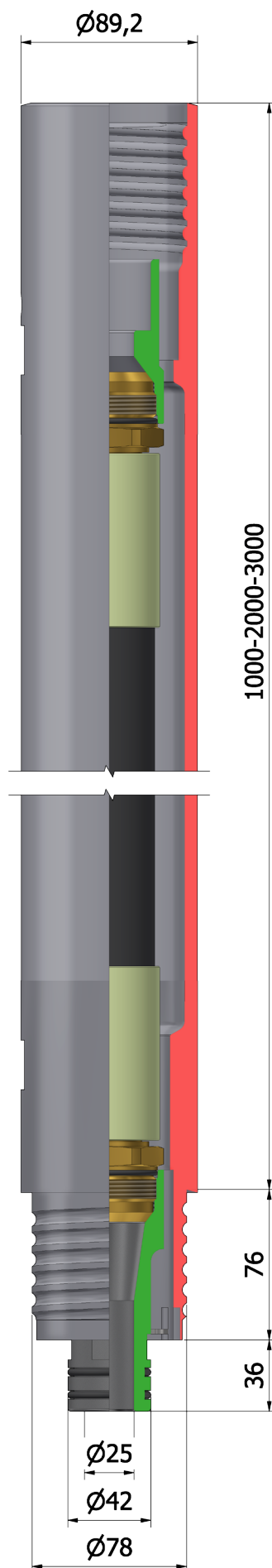
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                         |
|---------------------------------------------------------------------------------------------------|------|-------|-----------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                     |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                      |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                       |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 15                                      |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 8,9                                     |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 800                                     |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 25                                      |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 22 [L=1m]<br>37,2 [L=2m]<br>52,7 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 85                                      |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

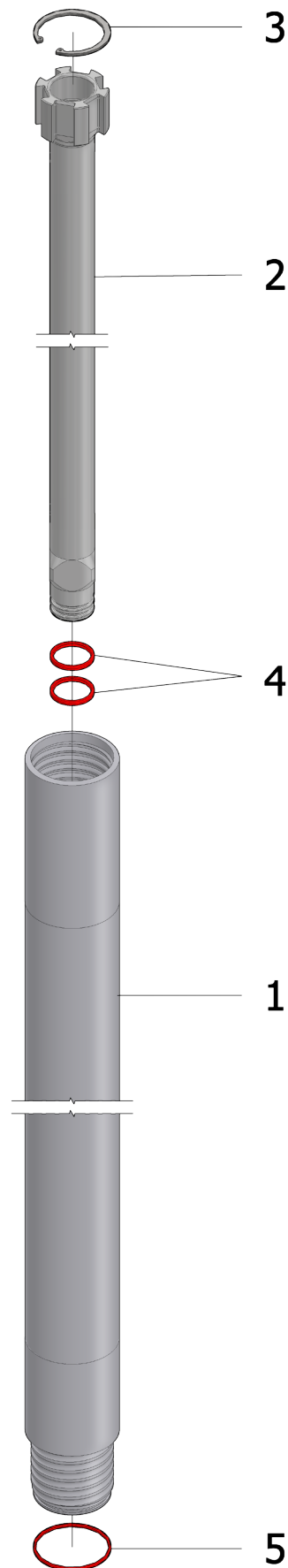
(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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### 3.10 D.90 C2 ROD (INNER STEEL PIPE)



**FIG. 3.10**

**D.90 C2 ROD (INNER STEEL PIPE): J-8C2S1000 (L=1000); J-8C2S1500 (L=1500); J-8C2S2000 (L=2000); J-8C2S3000 (L=3000)**  
(REF. FIG. 3.10)

| REF. No. | CODICE CODE         | DESCRIZIONE                         | DESCRIPTION                | QTY | NOTE |
|----------|---------------------|-------------------------------------|----------------------------|-----|------|
| 1        | D-525-101-XX00      | ASTA EST. D.90 C2 FRIZIONATA        | FRICTION. D.90 C2 EXT. ROD | 1   | (1)  |
| 2        | D-525-102F-XX00     | TUBO INT. D.90 C2 FRIZIONATO        | FRICT. D.90 C2 INNER ROD   | 1   | (1)  |
| 3        | UNI 7438 - 70       | ANELLO EL. SERIE PESANTE FORO D.70  | SPRING RING D.70 HOLE      | 1   |      |
| 4        | J-8C2S3011          | KIT GUARNIZIONI D.90 C2 ALTA PRESS. | D.90 C2 HP SEALS KIT       | 1   |      |
| 5        | K35-P 69.2x73.7x3.5 | GUARNIZIONE ASTA EST. D.90 C2       | D.90 C2 EXTERNAL ROD SEAL  | 1   |      |

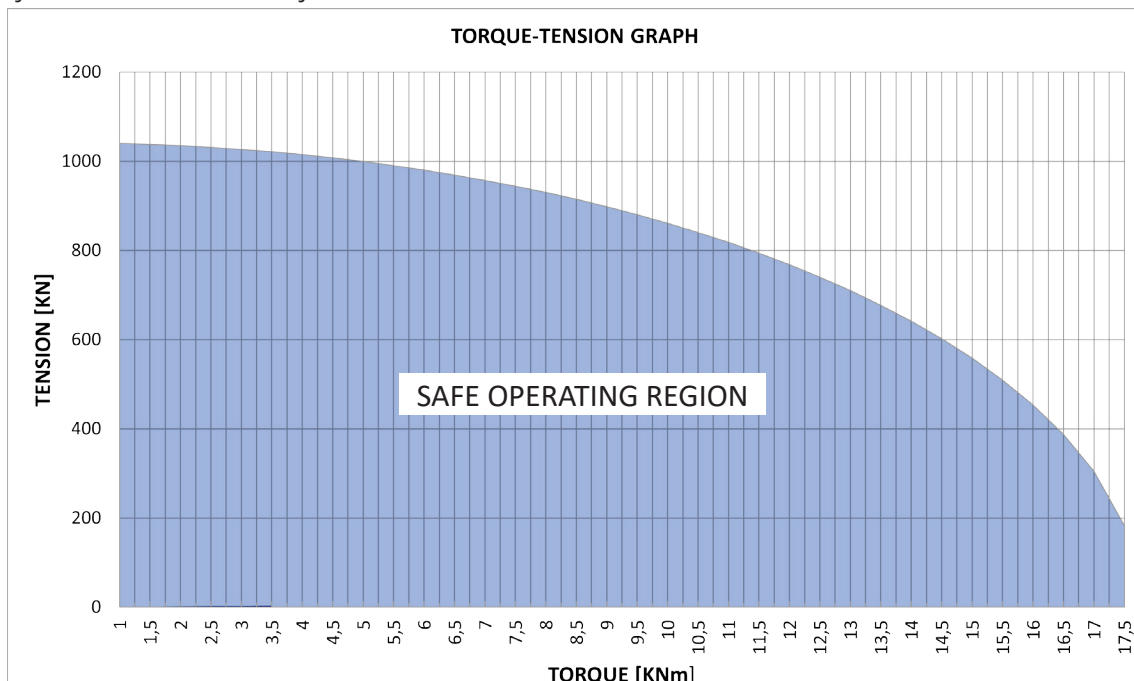
(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

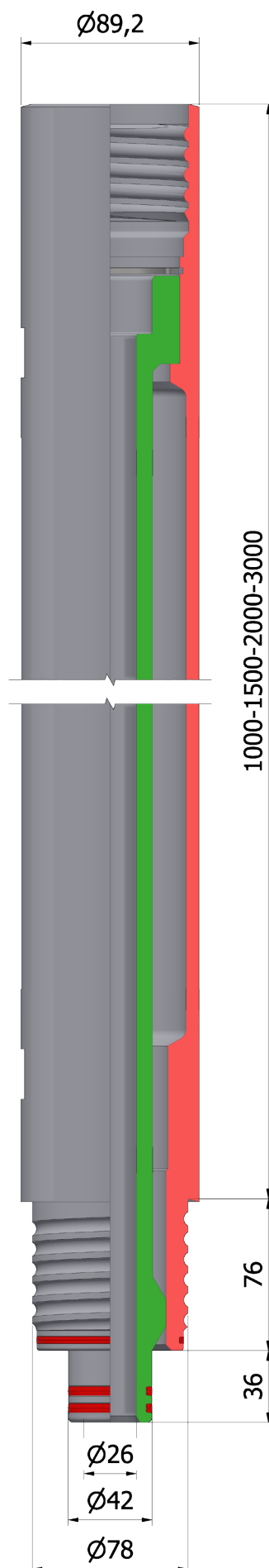
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                                      |
|---------------------------------------------------------------------------------------------------|------|-------|------------------------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                                  |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                                   |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 17,5                                                 |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 10,4                                                 |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1040                                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 25                                                   |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 23,5 [L=1m]<br>33 [L=1,5m]<br>43 [L=2m]<br>63 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 85                                                   |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

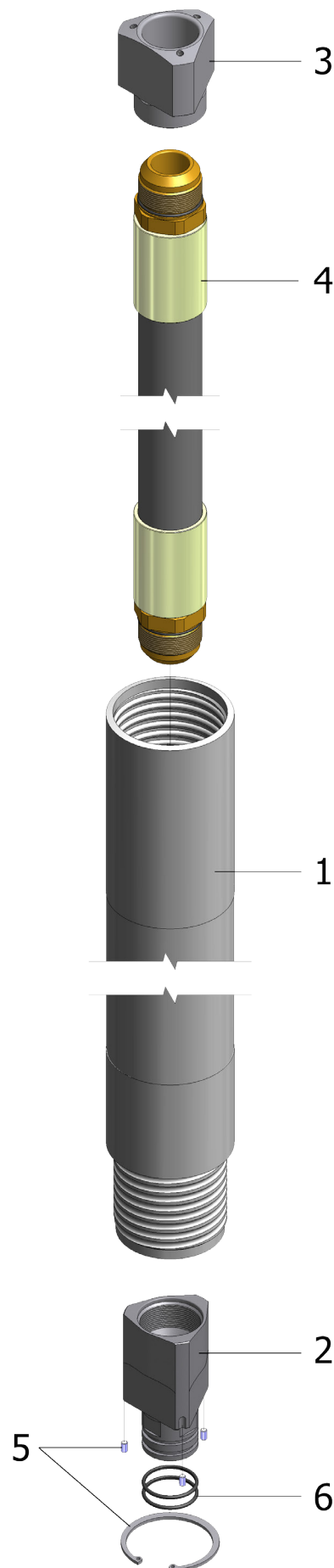




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### 3.11 D.114 C2 ROD (INNER RUBBER HOSE)



**FIG. 3.11**

**D.114 C2 ROD (INNER RUBBER HOSE): J-1C212100 (L=1000); J-1C212150 (L=1500); J-1C212200 (L=2000); J-1C212300 (L=3000) (REF. FIG. 3.11)**

| REF. No. | CODICE CODE  | DESCRIZIONE                     | DESCRIPTION                | QTY | NOTE             |
|----------|--------------|---------------------------------|----------------------------|-----|------------------|
| 1        | J-1C212X01   | TUBO ESTERNO D.114 C2           | D.114x1000 C2 EXTERNAL ROD | 1   | ( <sup>1</sup> ) |
| 2        | D-1082/1     | MANICOTTO MASCHIO INT. D.114 C2 | MALE INNER COUPL. D.114 C2 | 1   |                  |
| 3        | D-1082/2     | MANICOTTO FEMMINA INT. D.114 C2 | FEM. INNER COUPL. D.114 C2 | 1   |                  |
| 4        | J-1C212309-X | TUBO A.P. 1"-1/2                | 1"-1/2 HIGH PRESSURE HOSE  | 1   | ( <sup>1</sup> ) |
| 5        | J-1C212377   | KIT ASSEMBLAGGIO ASTA D.114 C2  | D.114 C2 ROD ASSEMBLY KIT  | 1   |                  |
| 6        | J-1C212311   | KIT GUARNIZIONI ASTA D.114 C2   | D.114 C2 ROD SEALS KIT     | 1   |                  |

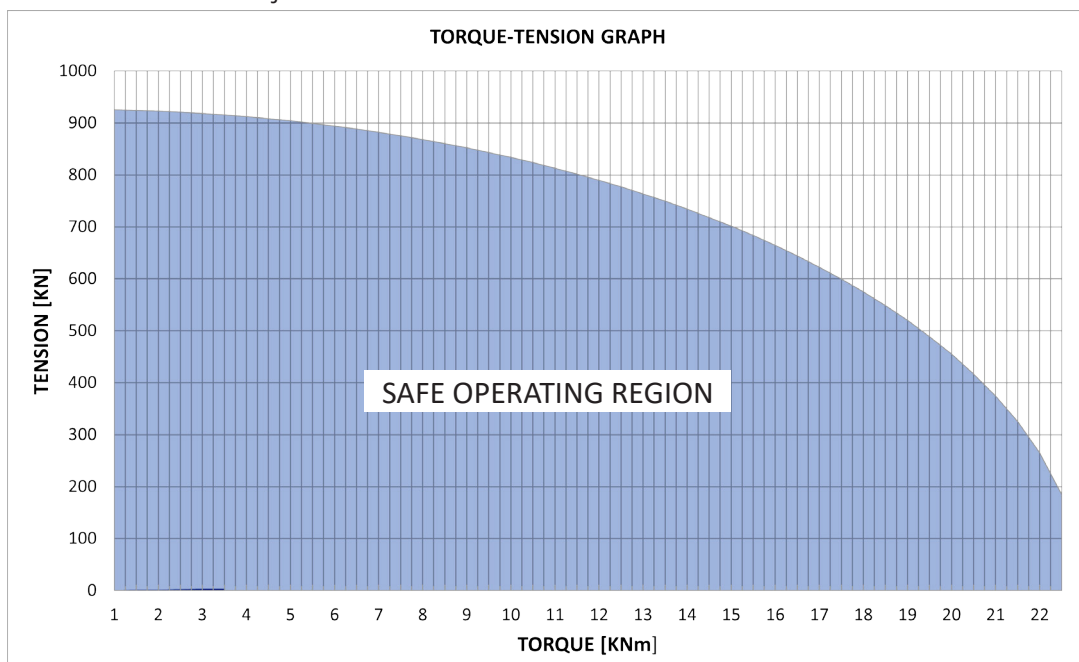
(<sup>1</sup>) L=1000 X=1; L=2000 X=2; L=3000 X=3

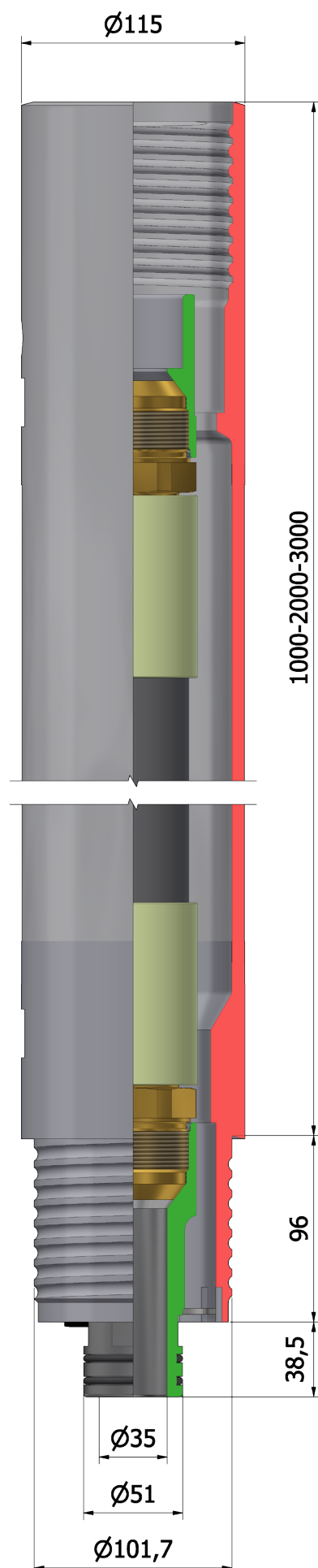
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                       |
|---------------------------------------------------------------------------------------------------|------|-------|---------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                   |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                    |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                     |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 22,5                                  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 13,5                                  |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 920                                   |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                    |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 32,6 [L=1m]<br>54 [L=2m]<br>76 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                   |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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3.12 D.114 C2 HOLLOW CLAMP De 132 ROD: J-1C212132

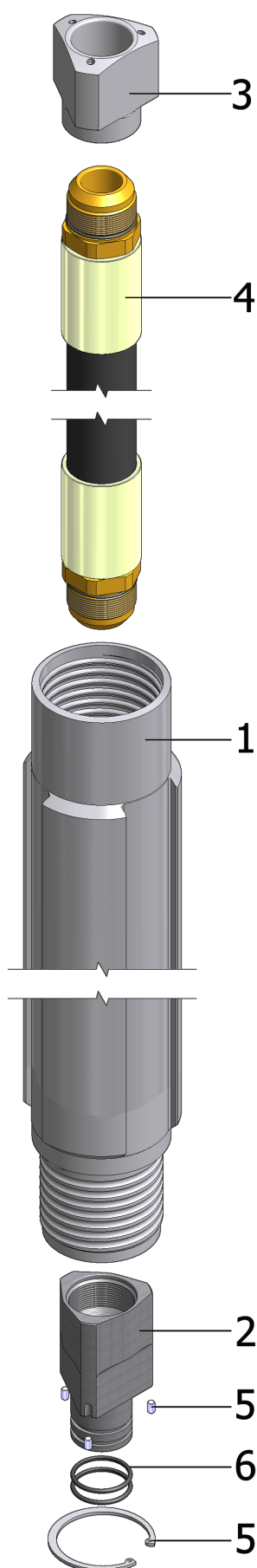


FIG. 3.12

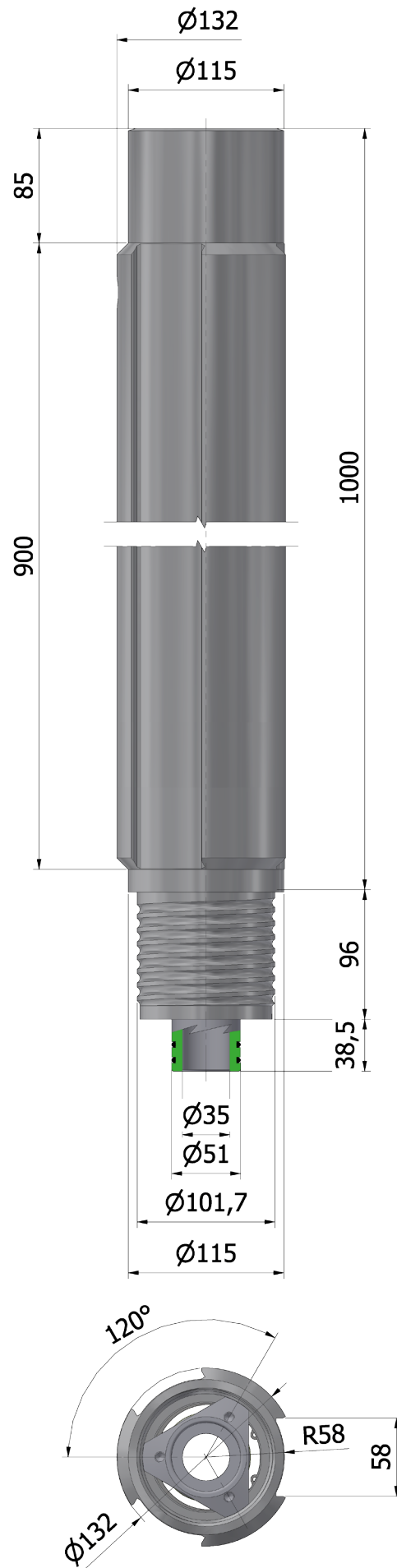
**De132 ROD FOR HOLLOW CLAMP; J-1C212132 (L=1000); (REF. FIG. 3.12)**

| REF. No. | CODICE CODE  | DESCRIZIONE                            | DESCRIPTION                        | QTY | NOTE |
|----------|--------------|----------------------------------------|------------------------------------|-----|------|
| 1        | D-1589-1A    | ASTA ESTERNA CALETTATA De132x1000      | O.D.132x1000 EXT. HOLLOW CLAMP ROD | 1   |      |
| 2        | D-1082/1     | MANICOTTO MASCHIO INT. D.114 C2        | MALE INNER COUPL. D.114 C2         | 1   |      |
| 3        | D-1082/2     | MANICOTTO FEMMINA INT. D.114 C2        | FEM. INNER COUPL. D.114 C2         | 1   |      |
| 4        | J-1C212309-1 | TUBO A.P. 1"-1/2 R13 (PER ASTA L.1000) | 1"-1/2 R13 HOSE (L.1000 ROD)       | 1   |      |
| 5        | J-1C212377   | KIT ASSEMBLAGGIO ASTA D.114 C2         | D.114 C2 ROD ASSEMBLY KIT          | 1   |      |
| 6        | J-1C212311   | KIT GUARNIZIONI ASTA D.114 C2          | D.114 C2 ROD SEALS KIT             | 1   |      |

**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                               |     |       |     |
|---------------------------------------------------------------|-----|-------|-----|
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                   |     | [MPa] | 56  |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                        |     | [MPa] | 3   |
| COPPIA MAX<br>MAX TORQUE                                      | (*) | [KNm] | 25  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                         | (*) | [KNm] | 15  |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE) | (*) | [KN]  | 940 |
| PESO<br>WEIGHT                                                |     | [Kg]  | 61  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.



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### 3.13 D.114 C2 ROD (INNER STEEL PIPE)

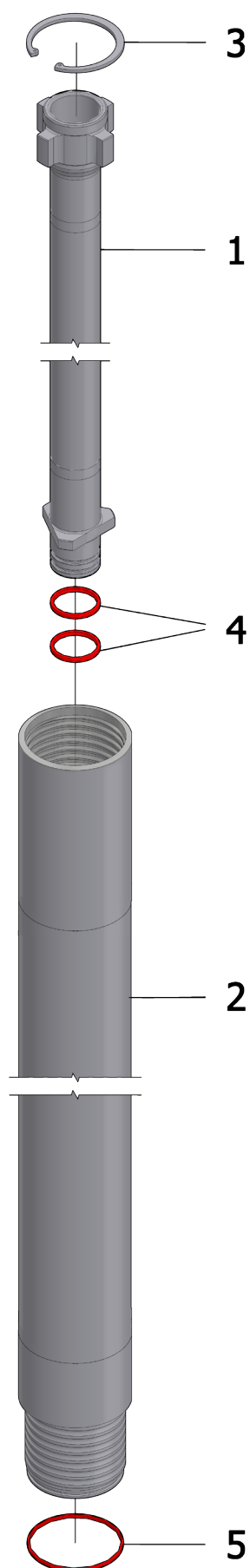


FIG. 3.13

**D.114 C2 ROD (INNER STEEL PIPE): J-1C212S10 (L=1000); J-1C212S15 (L=1500); J-1C212S20 (L=2000); J-1C212S30 (L=3000)**  
(REF. FIG. 3.13)

| REF. No. | CODICE CODE         | DESCRIZIONE                          | DESCRIPTION                 | QTY | NOTE             |
|----------|---------------------|--------------------------------------|-----------------------------|-----|------------------|
| 1        | D-1877-2-XX00       | ASTA EST. D.114 C2 FRIZIONATA        | FRICTION. D.114 C2 EXT. ROD | 1   | ( <sup>1</sup> ) |
| 2        | D-1877N-1-XX00      | TUBO INT. D.114 C2 FRIZIONATO        | FRICT. D.114 C2 INNER ROD   | 1   | ( <sup>1</sup> ) |
| 2        | D-1877N-1-XX00      | TUBO INT. D.114 C2 FRIZIONATO        | FRICT. D.114 C2 INNER ROD   | 1   | ( <sup>1</sup> ) |
| 3        | 7438D95S4           | ANELLO EL. SERIE PESANTE FORO D.95   | SPRING RING HEAVY SIZE D.95 | 1   |                  |
| 4        | J-1C212S31          | KIT GUARNIZIONI D.114 C2 ALTA PRESS. | D.114 C2 HP SEALS KIT       | 1   |                  |
| 5        | K35-P 93,4x97,9x3,5 | GUARNIZIONE ASTA EST. D.114 C2       | D.114 C2 EXTERNAL ROD SEAL  | 1   |                  |

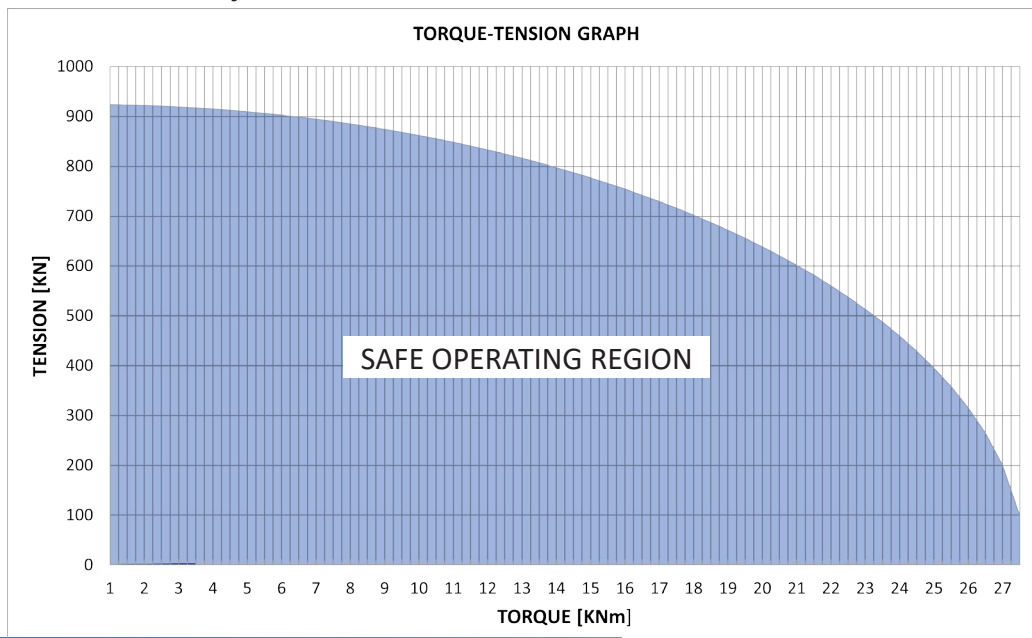
(<sup>1</sup>) L=1000 XX=10; L=1500 XX=15; L=2000 XX=20; L=3000 XX=30

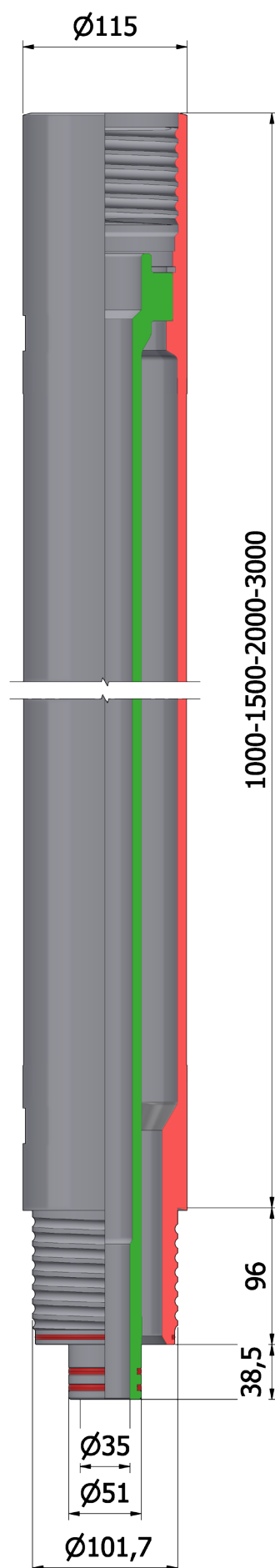
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                                    |
|---------------------------------------------------------------------------------------------------|------|-------|----------------------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                                |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                                 |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27,5                                               |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16,5                                               |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 920                                                |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                                 |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 31 [L=1m]<br>43 [L=1,5m]<br>54 [L=2m]<br>78 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                                |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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### 3.14 D.114 C2H ROD

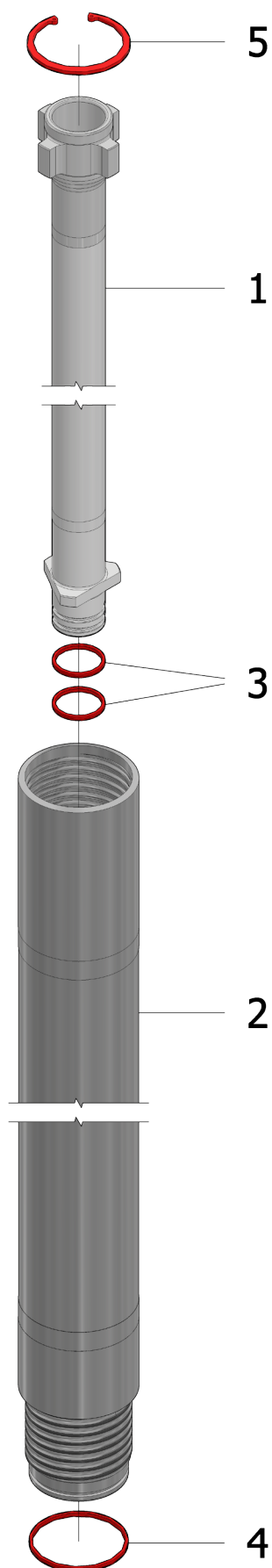


FIG. 3.14

**D.114 C2H ROD: J-1C2H1000 (L=1000); J-1C2H2000 (L=2000); J-1C2H3000 (L=3000) (REF. FIG. 3.14)**

| REF. No. | CODICE CODE    | DESCRIZIONE                        | DESCRIPTION                   | QTY | NOTE |
|----------|----------------|------------------------------------|-------------------------------|-----|------|
| 1        | D-1877N-1-X000 | TUBO INT. D.114 C2 FRIZIONATO      | FRICTIONED D.114 C2 INNER ROD | 1   | (1)  |
| 2        | J-1C2HX001     | ASTA ESTERNA D.114 C2H             | D.114 C2H EXTERNAL ROD        | 1   | (1)  |
| 3        | J-1C2H3011     | KIT GUARNIZIONI ASTA C2H D.114     | SEALS KIT C2H D.114 ROD       | 1   | (2)  |
| 4        | 7438D95S4      | ANELLO EL. SERIE PESANTE FORO D.95 | SPRING RING HEAVY SIZE D.95   | 1   |      |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

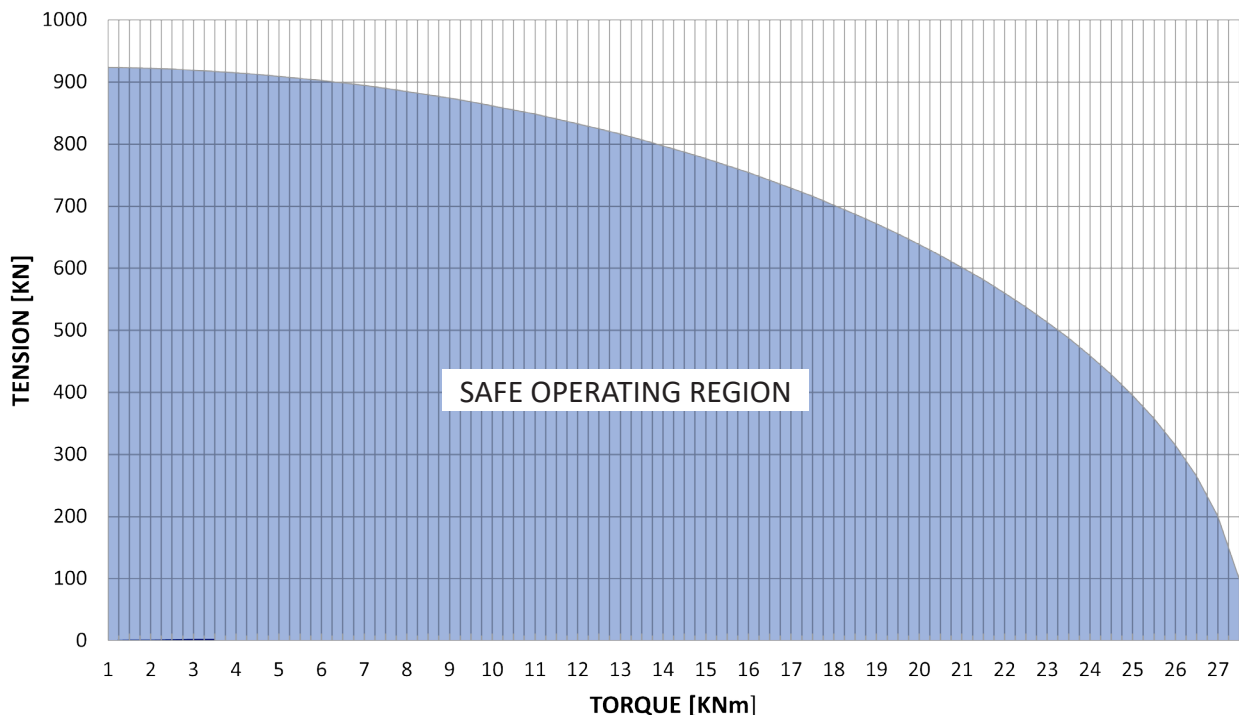
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

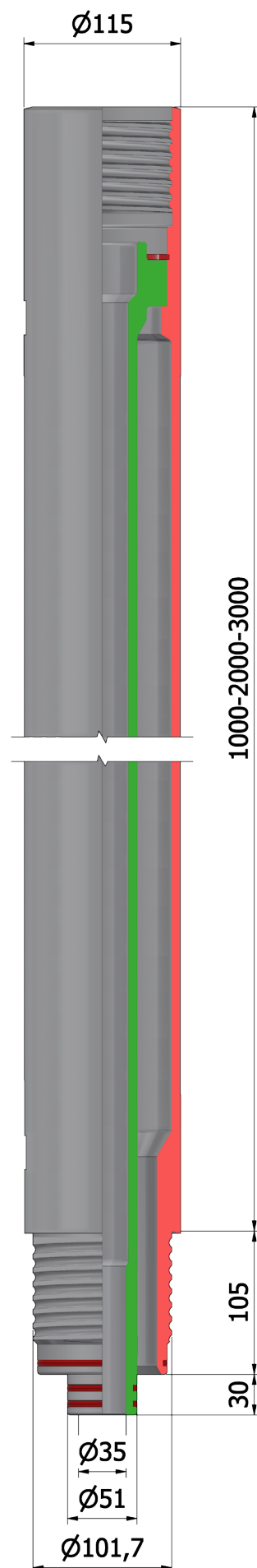
|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                 |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                  |
| PRESSIONE MAX ACQUA<br>WATER MAX PRESSURE                                                         |      | [MPa] | 45                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27,5                                |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16,5                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 920                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 31 [L=1m]<br>55 [L=2m]<br>78 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

**TORQUE-TENSION GRAPH**





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### 3.15 D.114 D2 ROD

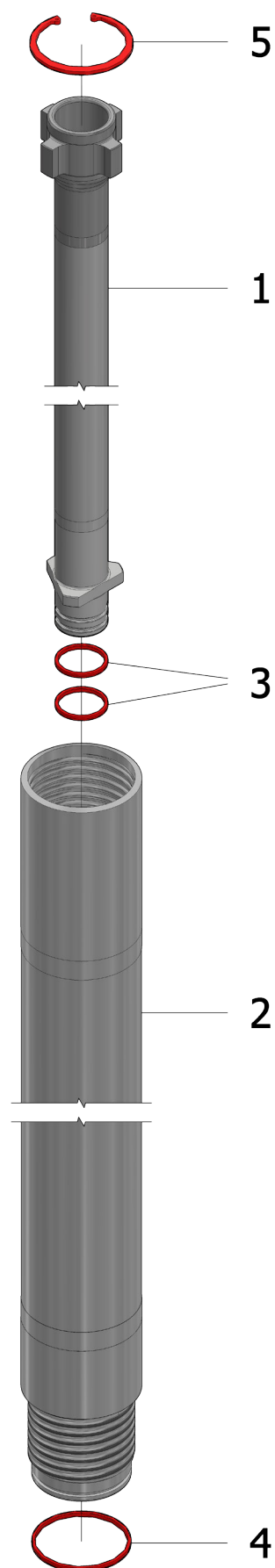


FIG. 3.15

**D.114 D2 ROD: J-W114D210 (L=1000); J-W114D220 (L=2000); J-W114D230 (L=3000) (REF. FIG. 3.15)**

| REF. No. | CODICE CODE | DESCRIZIONE                      | DESCRIPTION                  | QTY | NOTE |
|----------|-------------|----------------------------------|------------------------------|-----|------|
| 1        | D-1439-1/X  | ASTA INTERNA D.114 D2            | D.114 D2 INNER ROD           | 1   | (1)  |
| 2        | D-1439D-2/X | ASTA ESTERNA D.114 D2            | D.114 D2 EXT.ERNAL ROD       | 1   | (1)  |
| 3        | J-W114D231  | KIT GUARNIZIONI ASTA D2 D.114    | SEALS KIT D2 D.114 ROD       | 1   | (2)  |
| 3.1      | D-1439-A    | K35-P 44.8x51 L=4.5 T-ECOPUR     | K35-P 44.8x51 L=4.5 T-ECOPUR | 2   |      |
| 3.2      | D-1439-B    | K35P 88.8x95 L=4.5 T-ECOPUR      | K35P 88.8x95 L=4.5 T-ECOPUR  | 1   |      |
| 4        | 7438D95S4   | SEEGER x INTERNI D.95x4 UNI 7438 | D.95x4 UNI 7438 LOCKING RING | 1   |      |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

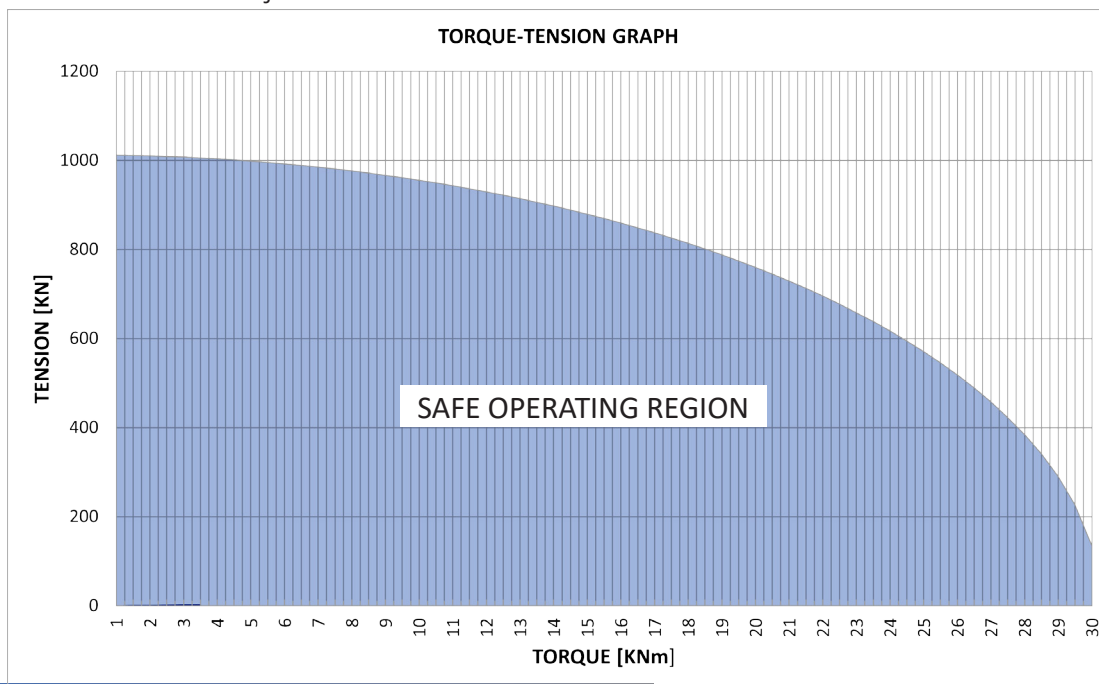
(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

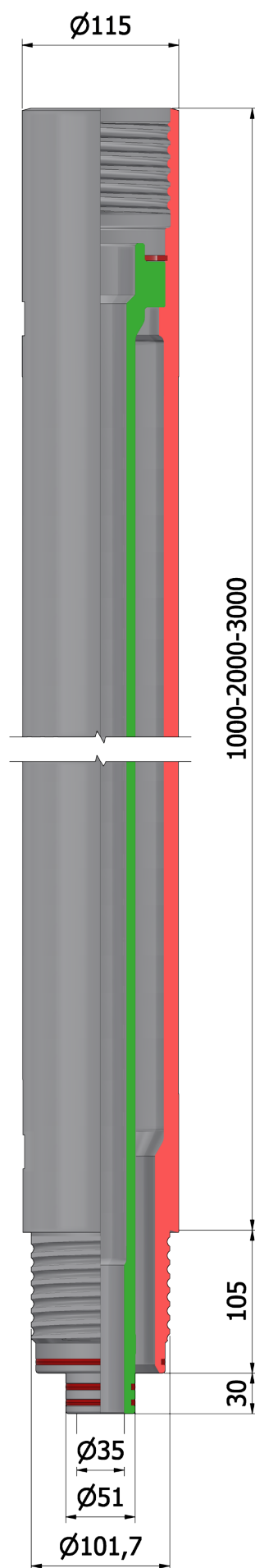
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |           |                                        |
|---------------------------------------------------------------------------------------------------|-----------|----------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   | [mm]      | 10                                     |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       | [MPa]     | 56                                     |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            | [MPa]     | 3                                      |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*) [KNm] | 30                                     |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*) [KNm] | 18                                     |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*) [KN]  | 1010                                   |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*) [m]   | 50                                     |
| PESO<br>WEIGHT                                                                                    | [Kg]      | 38 [L=1m]<br>71 [L=2m]<br>103,5 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) [mm] | 107                                    |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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### 3.16 D.114 MWJ ROD

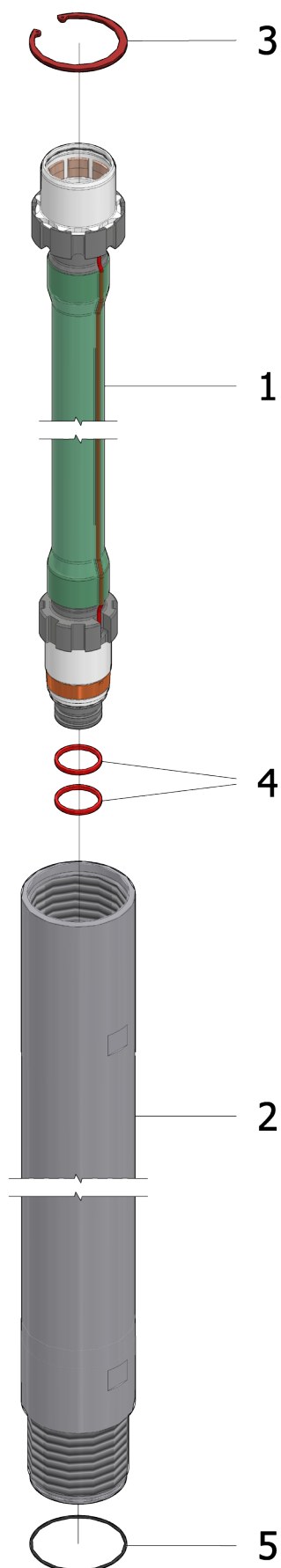


FIG. 3.16

**D.114 MWJ ROD: J-1C212S10-MWJ (L=1000); J-1C212S20-MWJ (L=2000); J-1C212S30-MWJ (L=3000) (REF. FIG. 3.16)**

| REF. No. | CODICE CODE         | DESCRIZIONE                        | DESCRIPTION                  | QTY | NOTE |
|----------|---------------------|------------------------------------|------------------------------|-----|------|
| 1        | D-1877-2-X000       | ASTA EST. D.114 C2 FRIZIONATA      | FRICTIONED D.114 C2 EXT. ROD | 1   |      |
| 2        | D-1862-1A-X000      | TUBO INT. D.114 MWJ CABLATO        | WIRED D.114 MWJ INNER ROD    | 1   |      |
| 3        | 7438D95S4           | ANELLO EL. SERIE PESANTE FORO D.95 | SPRING RING HEAVY SIZE D.95  | 1   |      |
| 4        | J-1C212S31-MWJ      | KIT GUARN. D.114 MWJ ALTA PRESS.   | D.114 MWJ HP SEALS KIT       | 1   |      |
| 5        | K35-P 93,4x97,9x3,5 | GUARNIZIONE ASTA EST. D.114 C2     | D.114 C2 EXTERNAL ROD SEAL   | 1   |      |

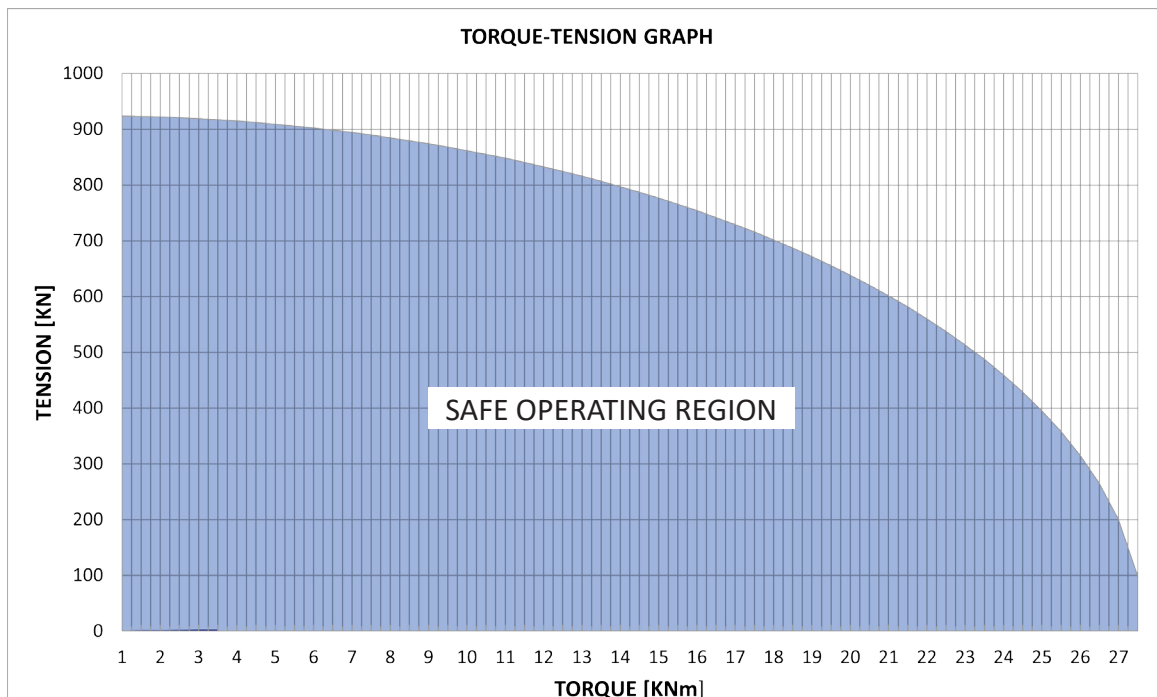
(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

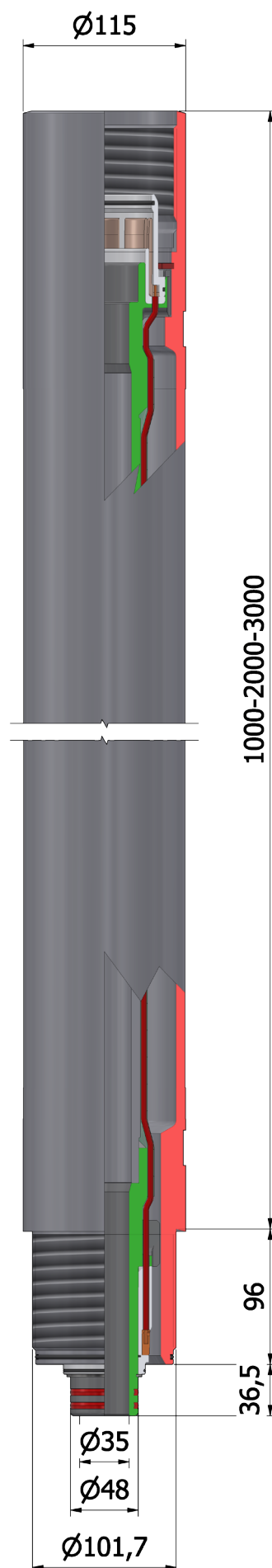
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                 |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                  |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                   |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27,5                                |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16,5                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 920                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 34 [L=1m]<br>61 [L=2m]<br>88 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

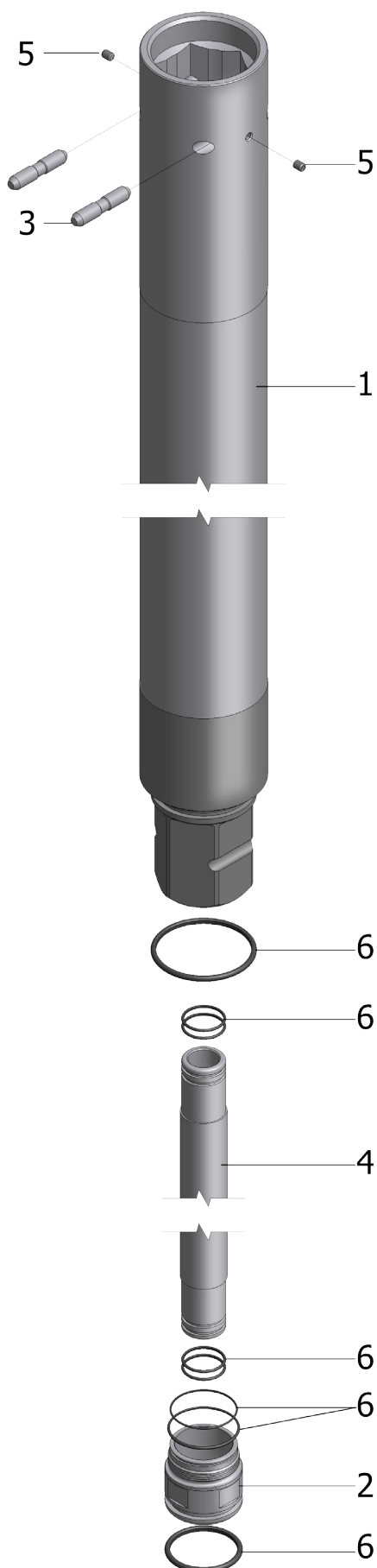




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### 3.17 D.114 C2H HEX 80 ROD



**FIG. 3.17**

**D.114 C2H HEX 80 ROD: J-EC2H1000 (L=1000); J-EC2H2000 (L=2000); J-EC2H3000 (L=3000) (REF. FIG. 3.17)**

| REF. No. | CODICE CODE        | DESCRIZIONE                     | DESCRIPTION              | QTY | NOTE |
|----------|--------------------|---------------------------------|--------------------------|-----|------|
| 1        | D-1531-1X          | ASTA ESTERNA D.114 C2H HEX80    | EXTERNAL ROD C2H HEX80   | 1   | (1)  |
| 2        | D-1531-1-3         | MANICOTTINO ANTERIORE C2H HEX80 | FRONT COUPLING C2H HEX80 | 1   |      |
| 3        | D-1383-1-4         | PERNO BLOCCO ASTE               | LOCKING PIN              | 2   |      |
| 4        | D-1531-1-Y         | TUBO INTERNO ASTA C2H HEX80     | C2H HEX80 INNER PIPE     | 1   | (2)  |
| 5        | 5925M8X10P125H45GR | GRANO PUNTA CIL. UNI 5925       | UNI 5925 LOCKING SCREW   | 2   |      |
| 6        | J-EC2H3011         | KIT GUARNIZIONI ASTA C2H HEX80  | C2H HEX80 ROD SEALS KIT  | 1   | (3)  |

(1) L=1000, X=FB; L=2000 X=FA; L=3000 X=F

(2) L=1000 Y=7; L=2000 Y=6; L=3000 Y=5

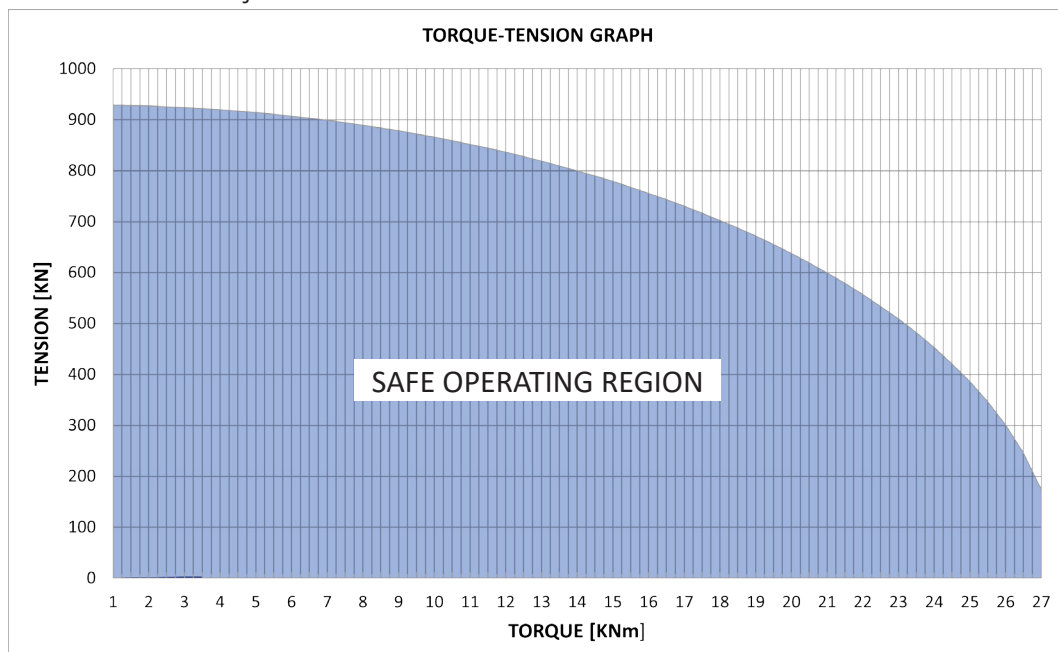
(3) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

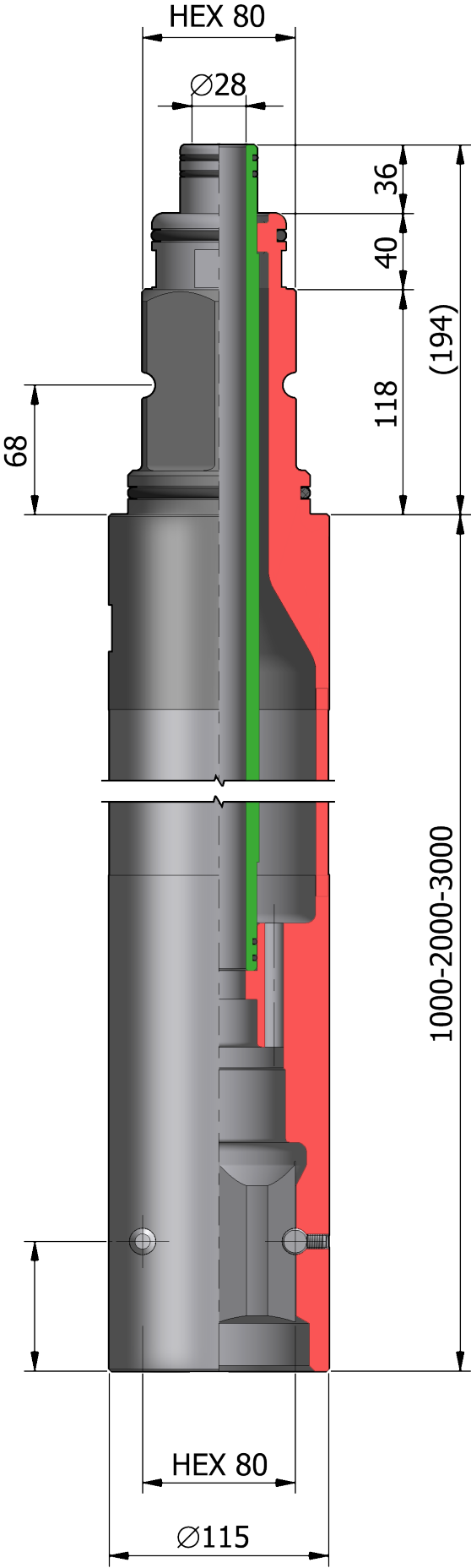
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                 |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                  |
| PRESSIONE MAX ACQUA<br>WATER MAX PRESSURE                                                         |      | [MPa] | 40                                  |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27                                  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | N.A.                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 930                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 33 [L=1m]<br>58 [L=2m]<br>83 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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### 3.18 D.114 C2 RP ROD

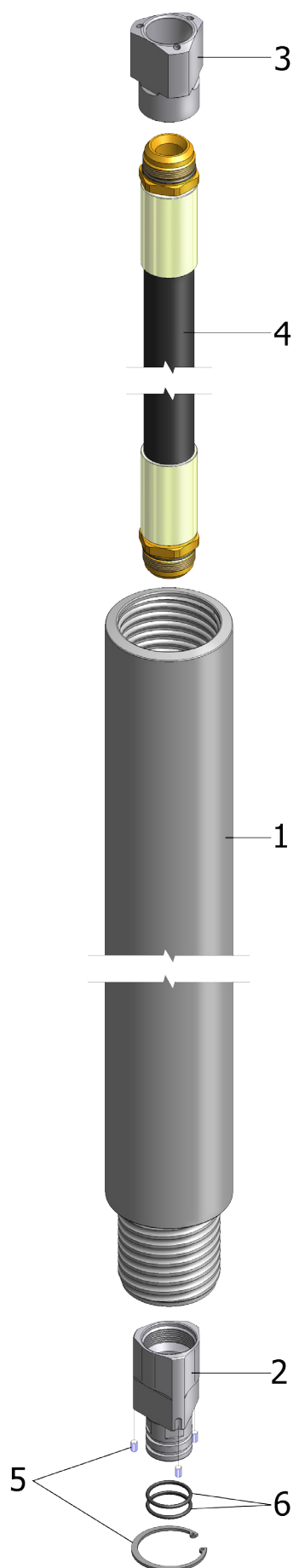


FIG. 3.18

**D.114 C2 RP ROD: J-1C2RP100 (L=1000); J-1C2RP200 (L=2000); J-1C2RP300 (L=3000) (REF. FIG. 3.18)**

| REF. No. | CODICE CODE  | DESCRIZIONE                       | DESCRIPTION                  | QTY | NOTE |
|----------|--------------|-----------------------------------|------------------------------|-----|------|
| 1        | J-1C2RPX01   | ASTA EST. D.114 C2 RP             | D.114 C2 RP EXTERNAL ROD     | 1   | (1)  |
| 2        | J-8C214305   | MANICOTTO M. INT. D.90 C2         | MALE INNER COUPLING D.90 C2  | 1   |      |
| 3        | J-8C214304   | MANICOTTO F. INT. D.90 C2         | FEM. INNER COUPLING D.90 C2  | 1   |      |
| 4        | J-8C214309-X | TUBO A.P. 1"-1/4 4SH              | 1"-1/4 4SH HOSE              | 1   | (1)  |
| 5        | J-1C2RP377   | KIT ASSEMBLAGGIO ASTA D.114 C2 RP | D.114 C2 RP ROD ASSEMBLY KIT | 1   |      |
| 6        | J-1C2RP311   | KIT GUARNIZIONI ASTA D.114 C2 RP  | D.114 C2 RP ROD SEALS KIT    | 1   | (2)  |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

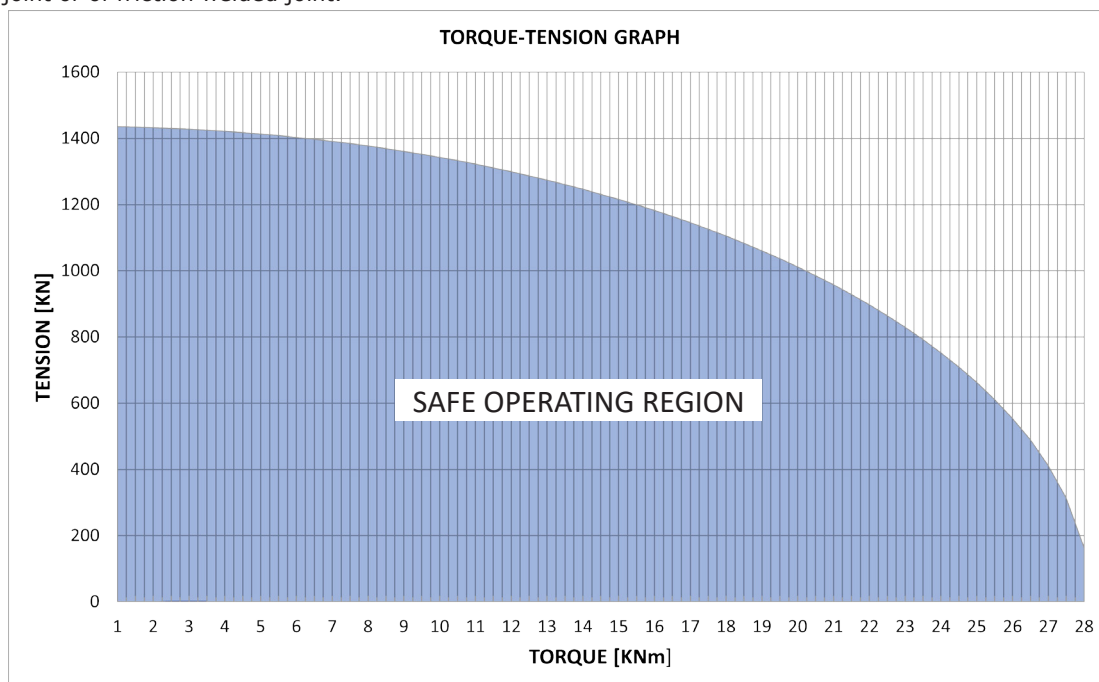
(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

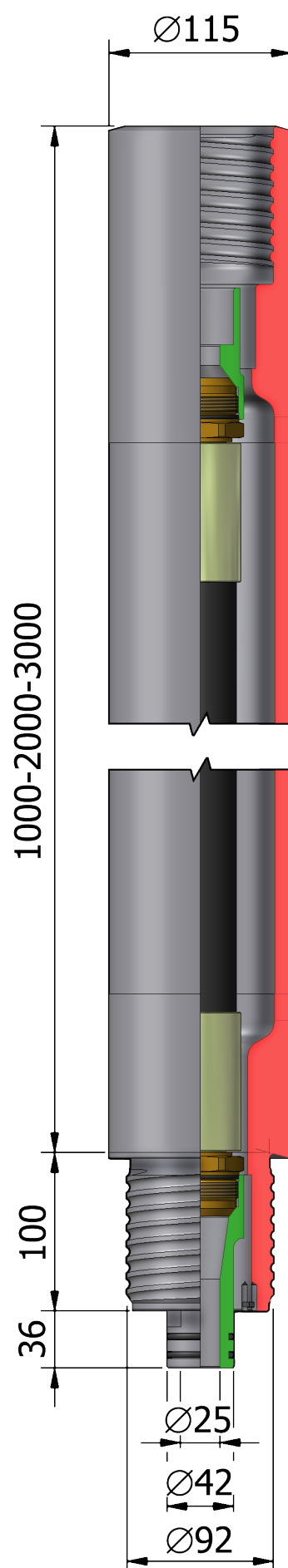
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                     |
|---------------------------------------------------------------------------------------------------|------|-------|-------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 10                                  |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                  |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                   |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 28                                  |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16,7                                |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1435                                |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                  |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 41 [L=1m]<br>69 [L=2m]<br>97 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 107                                 |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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3.19 D.127 C2 ROD

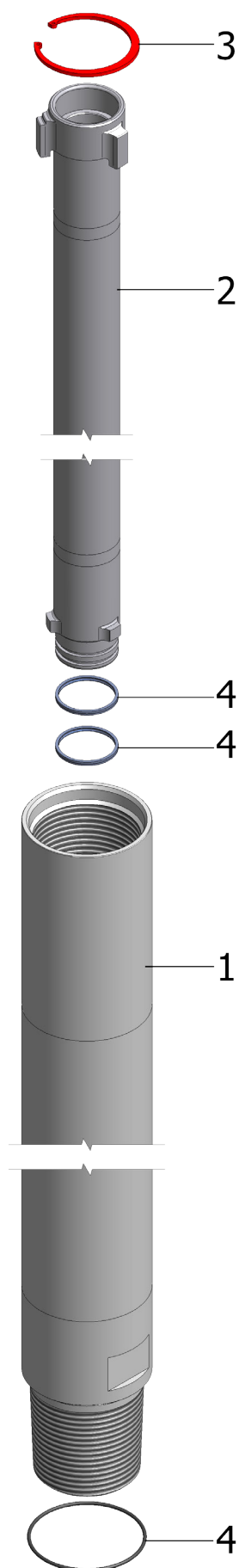


FIG. 3.19

**D.127 C2 ROD: J-12C21000 (L=1000); J-12C22000 (L=2000); J-12C23000 (L=3000) (REF. FIG. 3.19)**

| REF. No. | CODICE CODE | DESCRIZIONE                       | DESCRIPTION                 | QTY | NOTE |
|----------|-------------|-----------------------------------|-----------------------------|-----|------|
| 1        | J-12C2X001  | ASTA ESTERNA D.127 C2             | D.127 C2 EXTERNAL ROD       | 1   | (1)  |
| 2        | J-12C2X002  | ASTA INTERNA 127/140 C2           | 127/140 C2 INNER ROD        | 1   | (1)  |
| 3        | 7438D100S4  | SEEGER x INTERNI D.100x4 UNI 7438 | D.100x4 UNI 7438 LOCK. RING | 1   |      |
| 4        | J-12C23011  | KIT GUARNIZIONI ASTA D.127 C2     | D.127 C2 ROD SEALS KIT      | 1   | (2)  |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

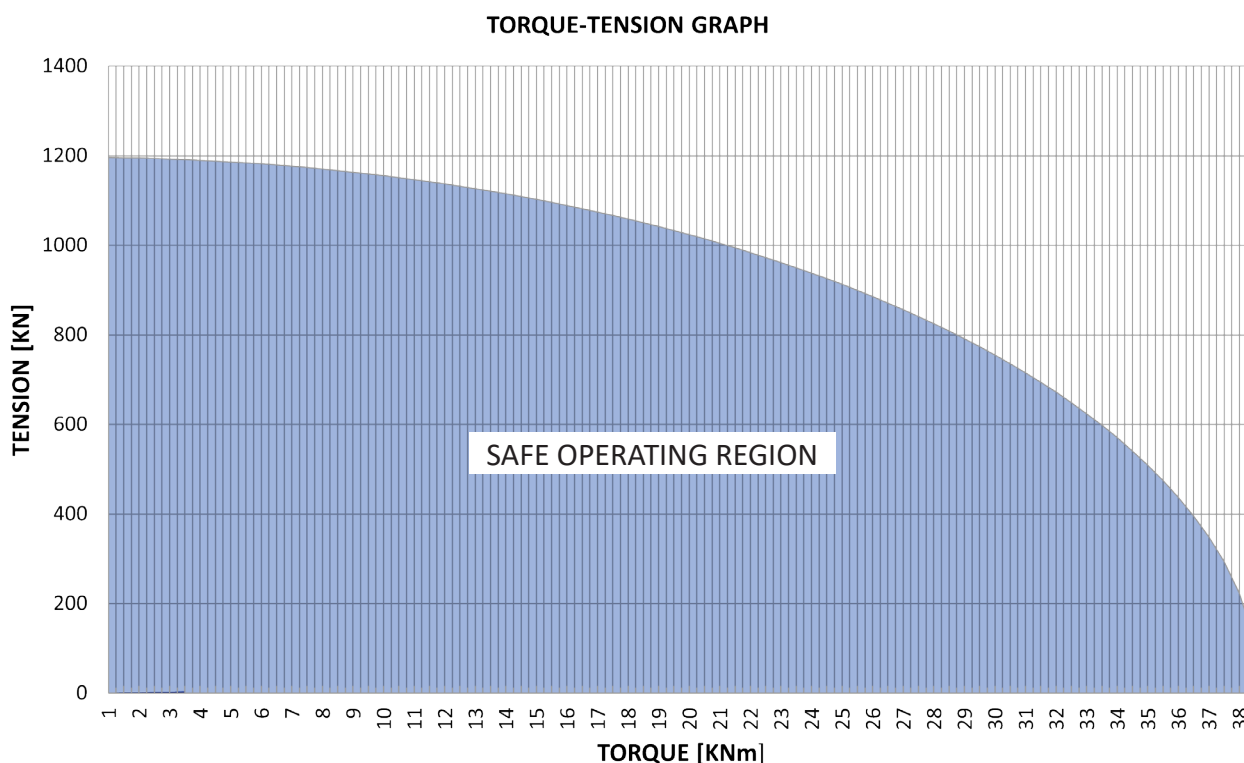
(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

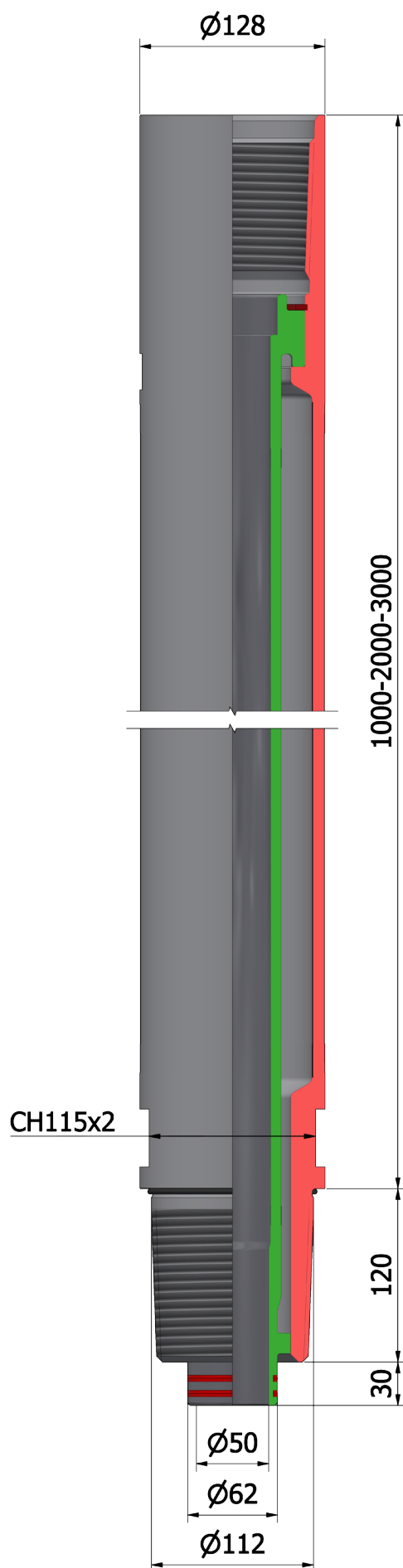
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                      |
|---------------------------------------------------------------------------------------------------|------|-------|--------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 8                                    |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                   |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 38,5                                 |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 23                                   |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1195                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 70                                   |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 43 [L=1m]<br>78 [L=2m]<br>112 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 121                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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3.20 D.140 C2 ROD

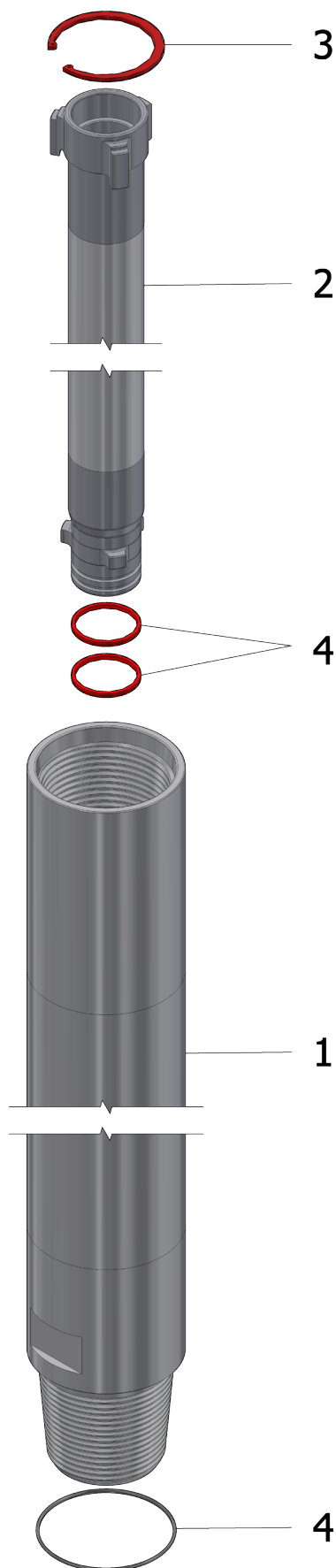


FIG. 3.20

**D.140 C2 ROD: J-14C21000 (L=1000); J-14C22000 (L=2000); J-14C23000 (L=3000) (REF. FIG. 3.20)**

| REF. No. | CODICE CODE | DESCRIZIONE                       | DESCRIPTION                 | QTY | NOTE |
|----------|-------------|-----------------------------------|-----------------------------|-----|------|
| 1        | J-14C2X001  | ASTA EST. D.140 C2                | D.140C2 EXTERNAL ROD        | 1   | (1)  |
| 2        | J-12C2X002  | ASTA INTERNA 127/140 C2           | 127/140 C2 INNER ROD        | 1   | (1)  |
| 3        | 7438D100S4  | SEEGER x INTERNI D.100x4 UNI 7438 | D.100x4 UNI 7438 LOCK. RING | 1   |      |
| 4        | J-14C23011  | KIT GUARNIZIONI ASTA D.140 C2     | D.140 C2 ROD SEALS KIT      | 1   | (2)  |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

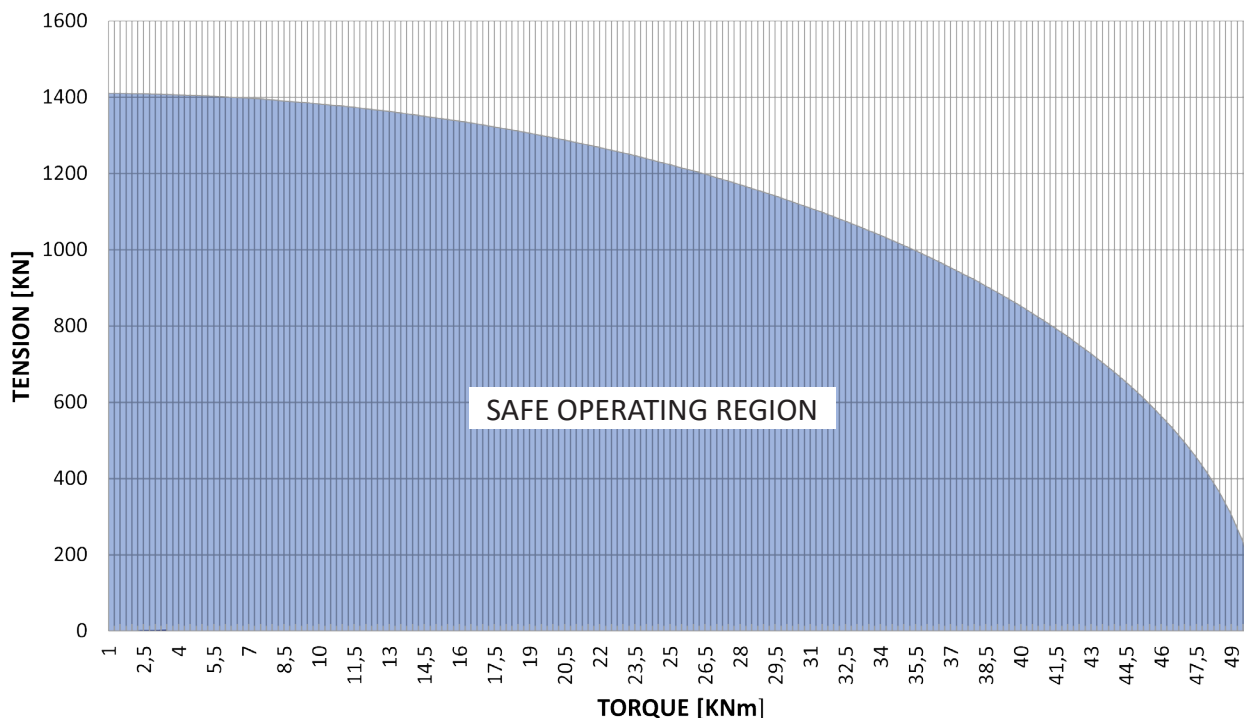
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

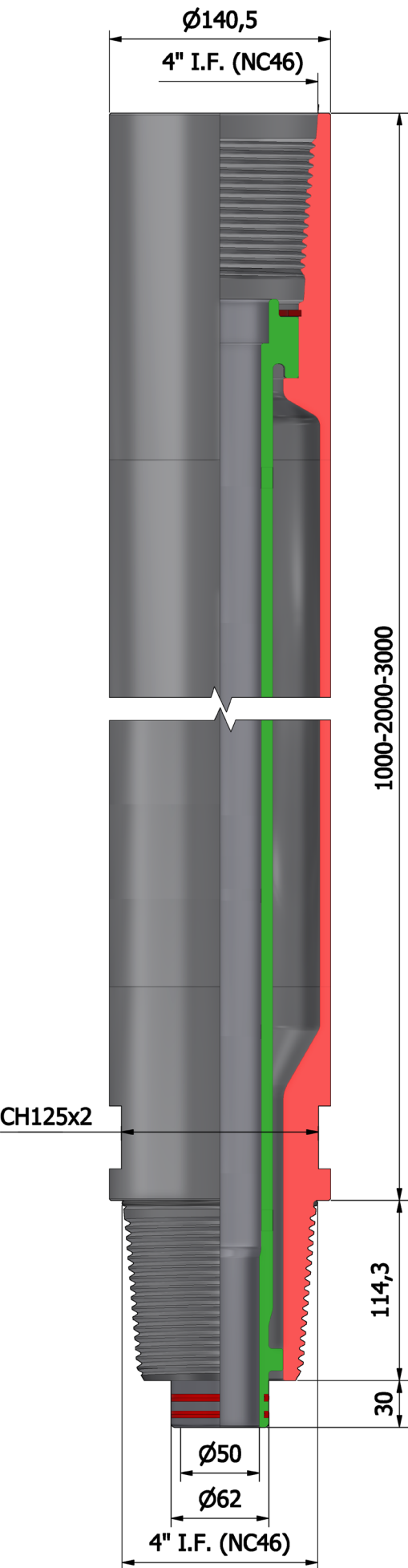
|                                                                                                   |      |       |                                      |
|---------------------------------------------------------------------------------------------------|------|-------|--------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 8,8                                  |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 56                                   |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 50                                   |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 29                                   |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1411                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 80                                   |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 46 [L=1m]<br>80 [L=2m]<br>114 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 133                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.

**TORQUE-TENSION GRAPH**





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### 3.21 D.114 T3 ROD

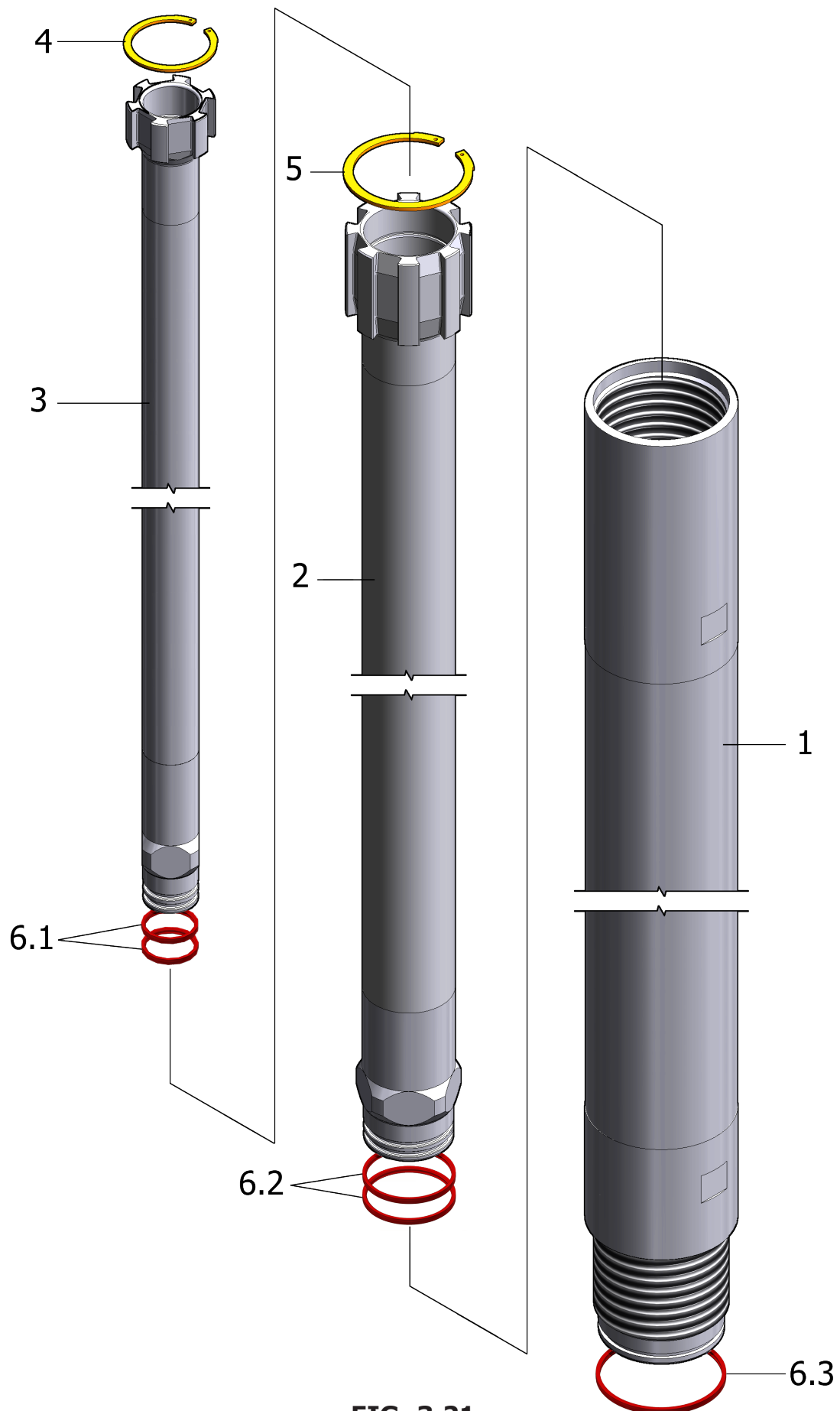


FIG. 3.21

**D.114 T3 ROD: J-W114T310 (L=1000); J-W114T320 (L=2000); J-W114T330 (L=3000) (REF. FIG. 3.21)**

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION               | QTY | NOTE |
|----------|--------------|-------------------------------------|---------------------------|-----|------|
| 1        | D-1731-3/X   | ASTA ESTERNA D.114 T3               | D.114 T3 EXTERNAL ROD     | 1   | (1)  |
| 2        | D-1731-2/X   | ASTA INTERMEDIA D.114 T3            | D.114 T3 MIDDLE ROD       | 1   | (1)  |
| 3        | D-1731-1/X   | ASTA INTERNA D.114 T3               | D.114 T3 INNER ROD        | 1   | (1)  |
| 4        | SEEGJVD68S25 | ANELLO SEEGER PER FORI D.68 TIPO JV | D.68 LOCKING RING JV TYPE | 1   |      |
| 5        | SEEGJVD95S3  | ANELLO SEEGER PER FORI D.95 TIPO JV | D.95 LOCKING RING JV TYPE | 1   |      |
| 6        | J-W114T331   | KIT GUARNIZIONI ASTA D.114 T3       | D.114 T3 SEALS KIT        | 1   |      |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

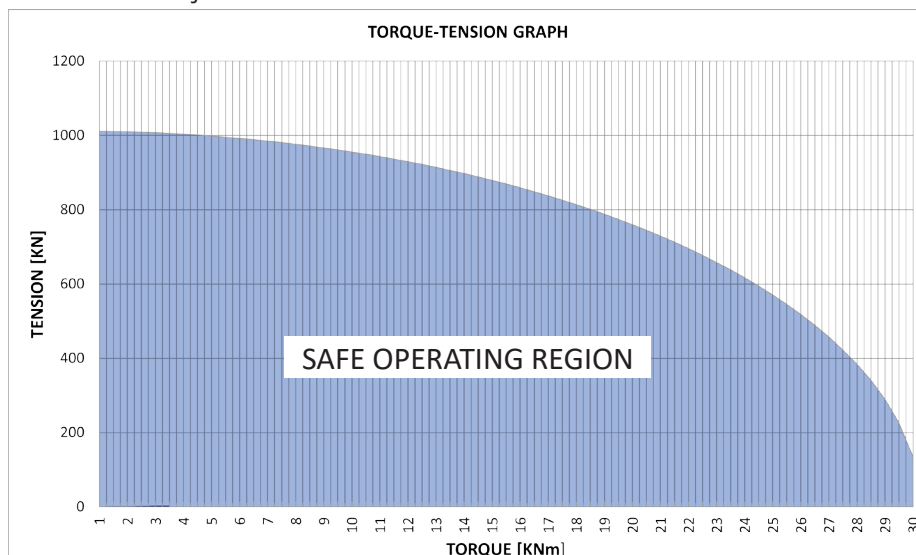
(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

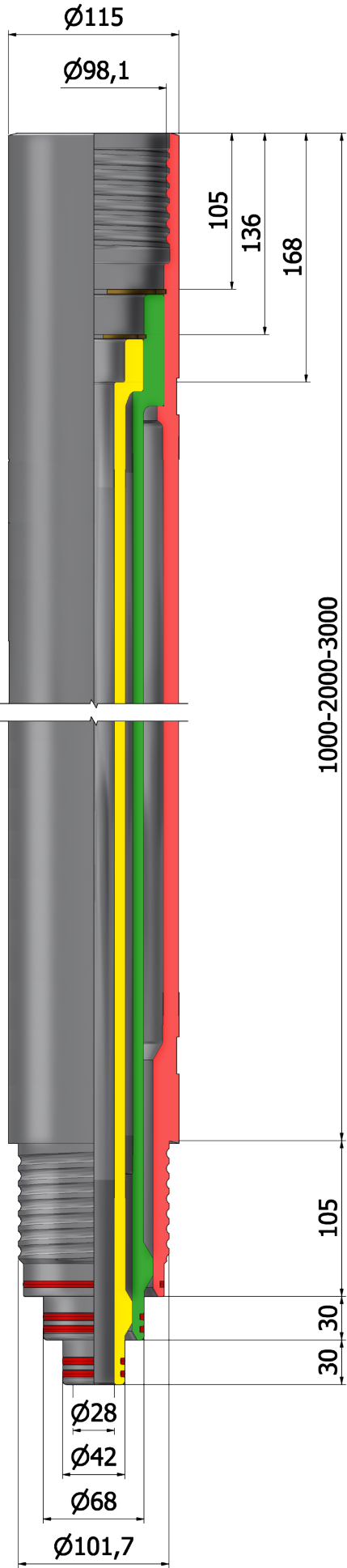
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                      |
|---------------------------------------------------------------------------------------------------|------|-------|--------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 10                                   |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 30                                   |
| PRESSIONE MAX ACQUA<br>WATER MAX PRESSURE                                                         |      | [MPa] | 50                                   |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 30                                   |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 18                                   |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1010                                 |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 50                                   |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 49 [L=1m]<br>92 [L=2m]<br>135 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 107                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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3.22 D.114 C3 ROD

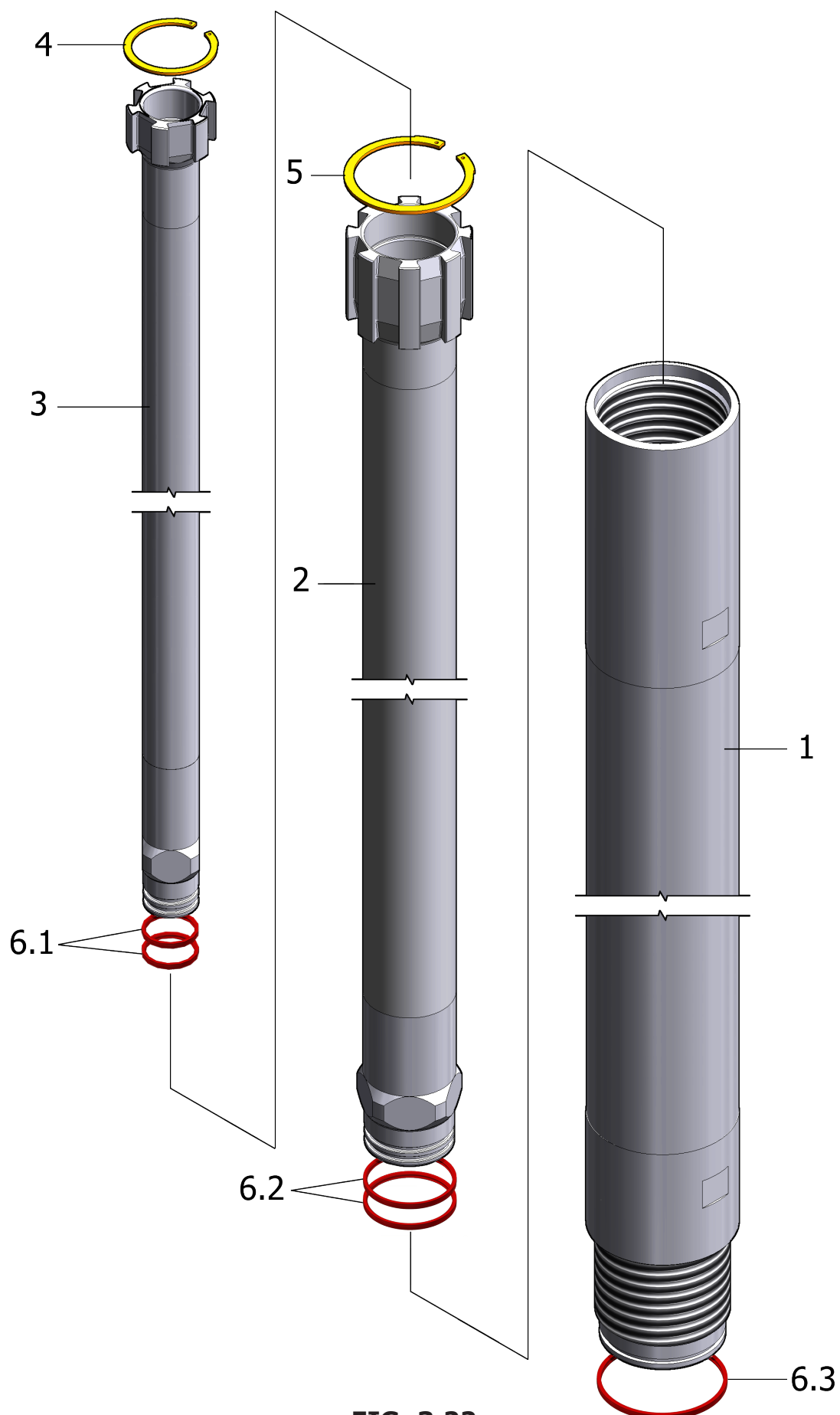


FIG. 3.22

**D.114 C3 ROD: J-114C3100 (L=1000); J-114C3200 (L=2000); J-114C3300 (L=3000) (REF. FIG. 3.22)**

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION               | QTY | NOTE |
|----------|--------------|-------------------------------------|---------------------------|-----|------|
| 1        | D-1731-C3/X  | ASTA ESTERNA D.114 C3               | D.114 C3 EXTERNAL ROD     | 1   | (1)  |
| 2        | D-1731-2/X   | ASTA INTERMEDIA D.114 T3            | D.114 T3 MIDDLE ROD       | 1   | (1)  |
| 3        | D-1731-1/X   | ASTA INTERNA D.114 T3               | D.114 T3 INNER ROD        | 1   | (1)  |
| 4        | SEEGJVD68S25 | ANELLO SEEGER PER FORI D.68 TIPO JV | D.68 LOCKING RING JV TYPE | 1   |      |
| 5        | SEEGJVD95S3  | ANELLO SEEGER PER FORI D.95 TIPO JV | D.95 LOCKING RING JV TYPE | 1   |      |
| 6        | J-W114T331   | KIT GUARNIZIONI ASTA D.114 T3       | D.114 T3 SEALS KIT        | 1   |      |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

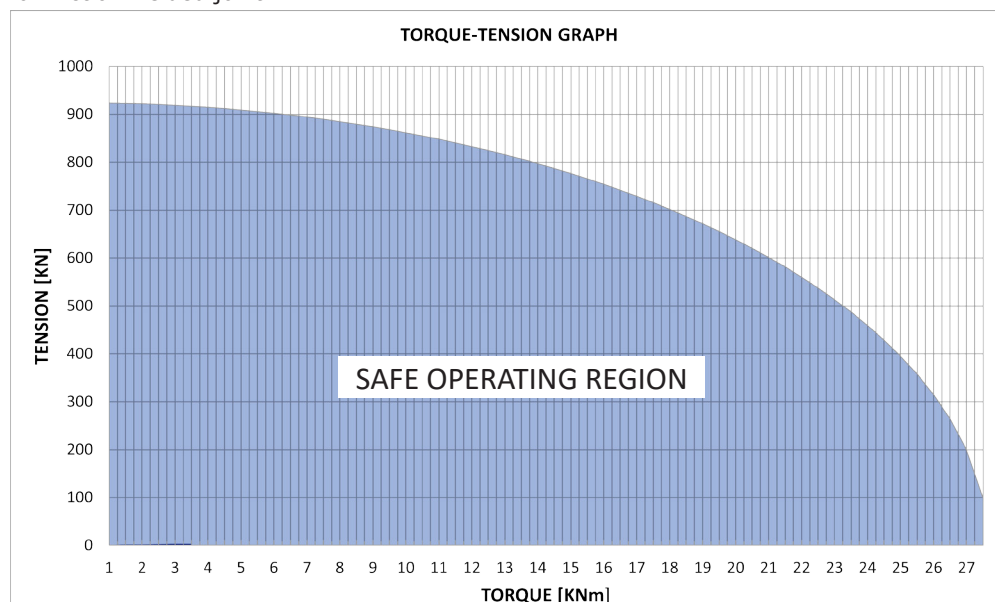
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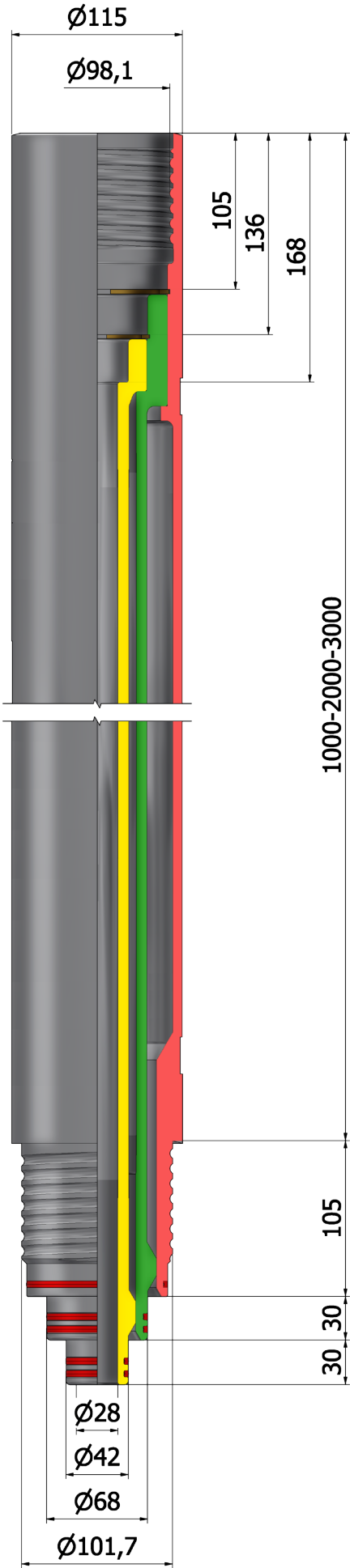
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                      |
|---------------------------------------------------------------------------------------------------|------|-------|--------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 6,3                                  |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 30                                   |
| PRESSIONE MAX ACQUA<br>WATER MAX PRESSURE                                                         |      | [MPa] | 50                                   |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                    |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 27,5                                 |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 16,5                                 |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 920                                  |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 45                                   |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 42 [L=1m]<br>77 [L=2m]<br>111 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 110                                  |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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### 3.23 D.127 C3 ROD

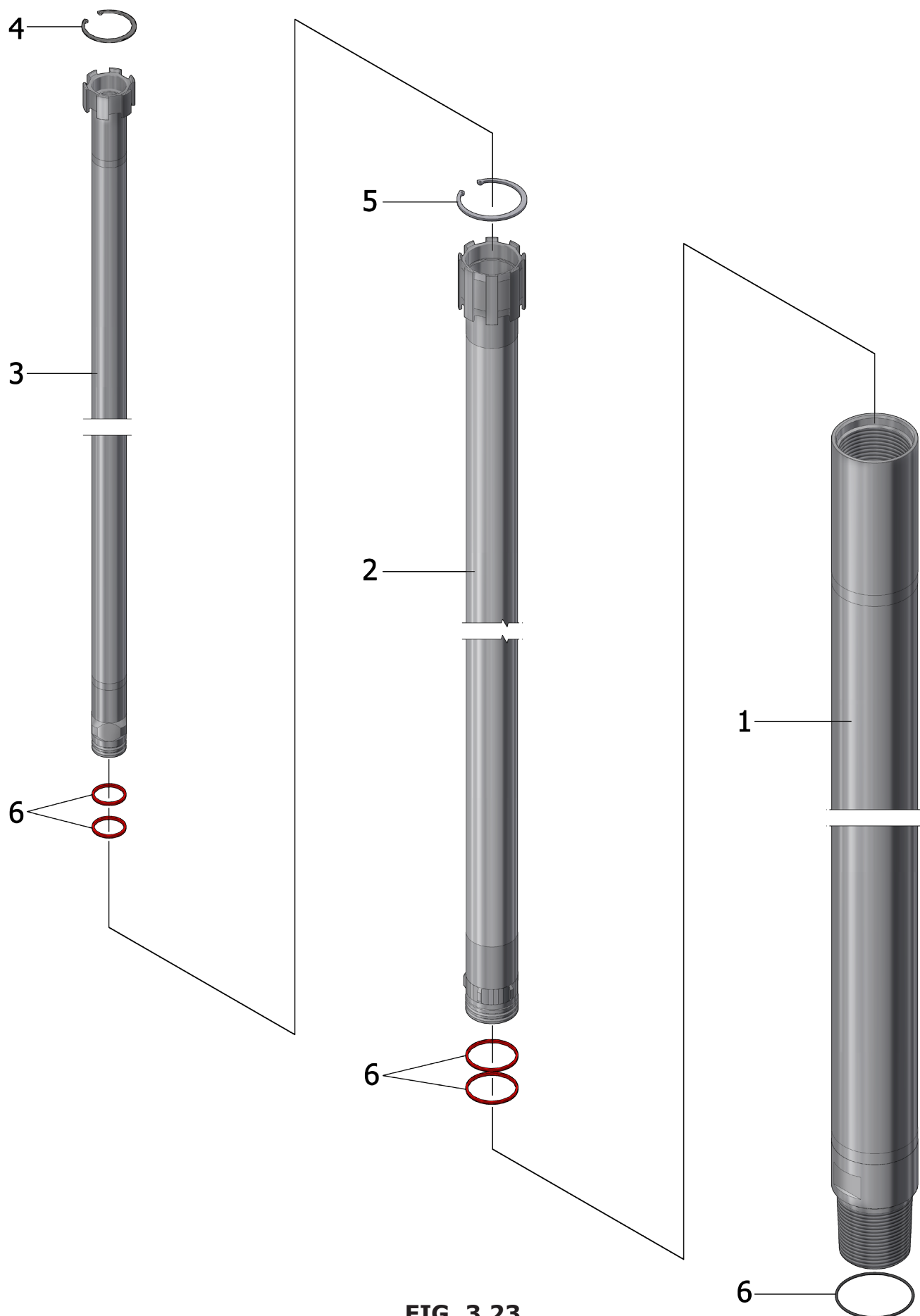


FIG. 3.23

**D.127 C3 ROD: J-12C31000 (L=1000); J-12C32000 (L=2000); J-12C33000 (L=3000) (REF. FIG. 3.23)**

| REF. No. | CODICE CODE | DESCRIZIONE                           | DESCRIPTION                 | QTY | NOTE |
|----------|-------------|---------------------------------------|-----------------------------|-----|------|
| 1        | J-12C3X001  | ASTA ESTERNA D.127 C3                 | D.127 C3 EXT. ROD           | 1   | (1)  |
| 2        | J-12C3X002  | ASTA INTERMEDIA D.127 C3              | D.127 C3 MIDDLE ROD         | 1   | (1)  |
| 3        | J-12C3X003  | ASTA INTERNA D.127 C3                 | D.127 C3 INNER ROD          | 1   | (1)  |
| 4        | 7437D78S25  | ANELLO ELAST. PER FORI D.78 UNI 7437  | D.78 UNI 7437 LOCKING RING  | 1   |      |
| 5        | 7437D100S3  | ANELLO ELAST. PER FORI D.100 UNI 7437 | D.100 UNI 7437 LOCKING RING | 1   |      |
| 6        | J-12C33011  | KIT GUARNIZIONI ASTA D.127 C3         | D.127 C3 SEALS KIT          | 1   | (2)  |

(1) L=1000 X=1; L=2000 X=2; L=3000 X=3

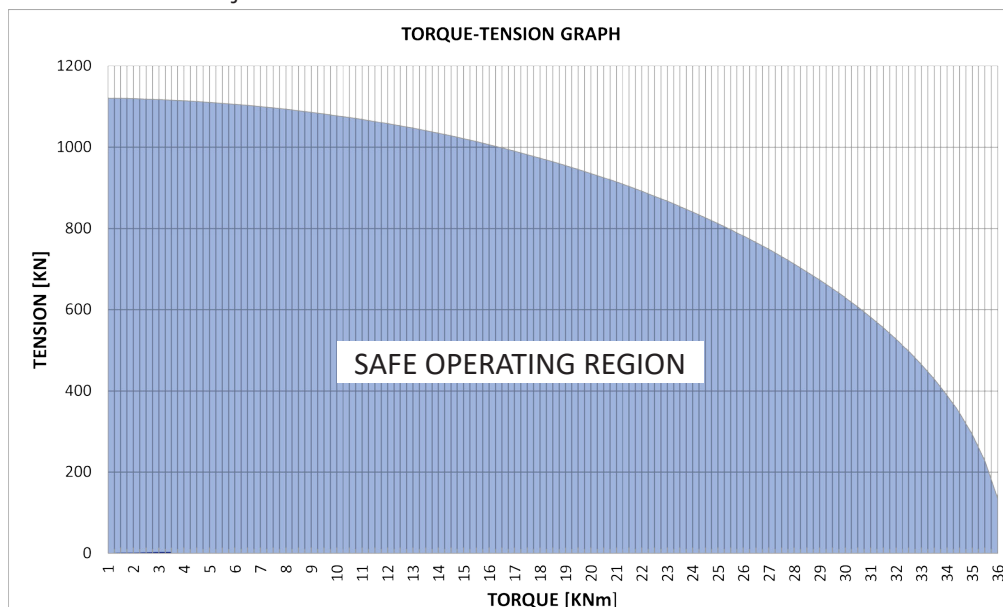
(2) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY

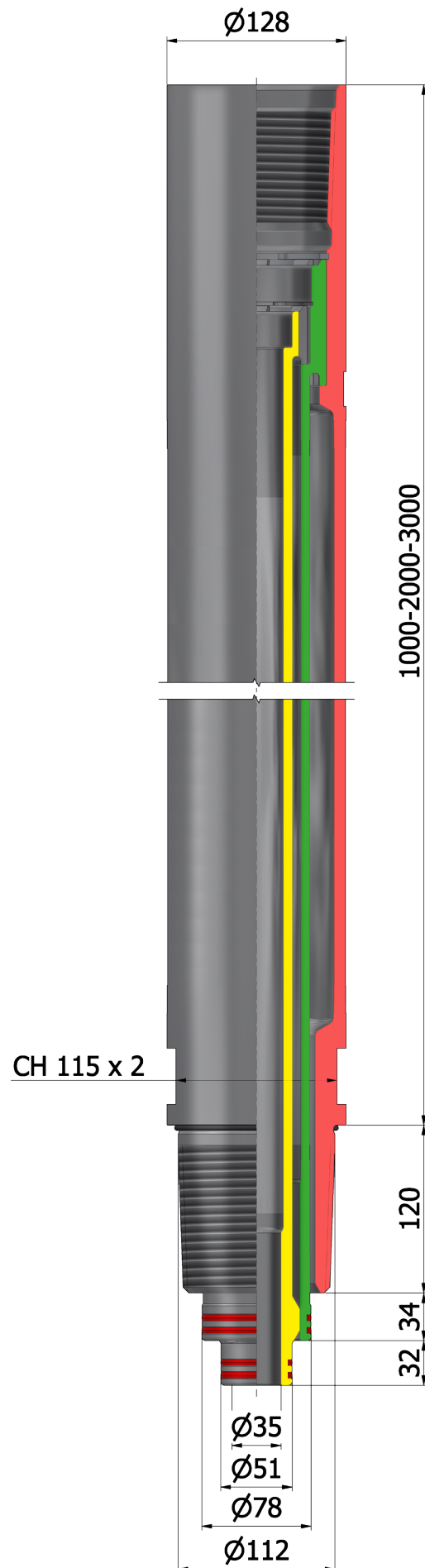
**MECHANICAL SPECIFICATIONS - CARATTERISTICHE MECCANICHE (SAFETY FACTOR = 2)**

|                                                                                                   |      |       |                                        |
|---------------------------------------------------------------------------------------------------|------|-------|----------------------------------------|
| SPESSORE TUBO<br>WALL THICKNESS                                                                   |      | [mm]  | 8                                      |
| PRESSIONE MAX CEMENTO<br>GROUT MAX PRESSURE                                                       |      | [MPa] | 42                                     |
| PRESSIONE MAX ACQUA<br>WATER MAX PRESSURE                                                         |      | [MPa] | 55                                     |
| PRESSIONE MAX ARIA<br>AIR MAX PRESSURE                                                            |      | [MPa] | 3                                      |
| COPPIA MAX<br>MAX TORQUE                                                                          | (*)  | [KNm] | 36                                     |
| COPPIA DI SERRAGGIO<br>MAKE-UP TORQUE                                                             | (*)  | [KNm] | 21,5                                   |
| TIRO MAX (SENZA COPPIA)<br>ULTIMATE TRACTION (WITHOUT TORQUE)                                     | (*)  | [KN]  | 1120                                   |
| PROFONDITA' OPERATIVA<br>DEPTH CAPACITY                                                           | (*)  | [m]   | 70                                     |
| PESO<br>WEIGHT                                                                                    |      | [Kg]  | 48,5 [L=1m]<br>85 [L=2m]<br>122 [L=3m] |
| DIAMETRO MINIMO OPERATIVO (DA CONSUMO PER ATTRITO)<br>MINIMUM OPERATING DIAMETER (DUE TO WEARING) | (**) | [mm]  | 121                                    |

(\*) Dati validi per aste nuove non usate e per perforazioni standard - Performance values are applicable to new unused rods and standard drilling practices.

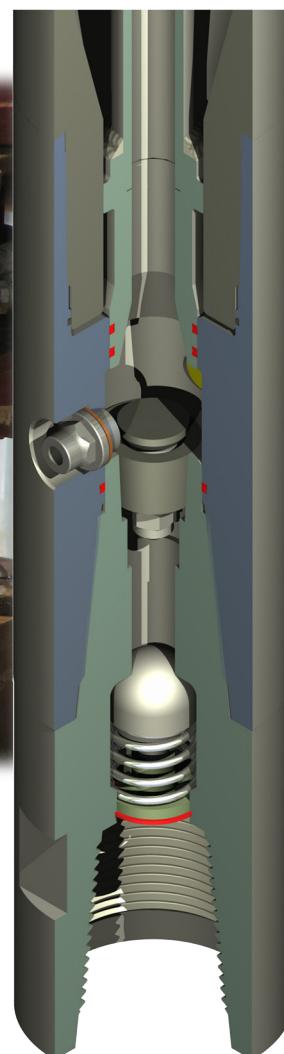
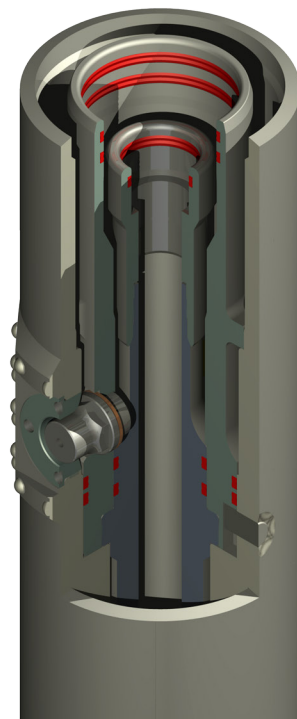
(\*\*) Diametro minimo misurato sul manicotto femmina o sulla zona della giunzione frizionata - Minimum measured diameter of female joint or of friction welded joint.





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## 4 MONITOR - NOZZLE HOLDERS



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## INDEX OF PART 4

|      |                                                                       |      |
|------|-----------------------------------------------------------------------|------|
| 4    | MONITOR - NOZZLE HOLDERS .....                                        | 4-1  |
| 4.1  | D.90 C2 STANDARD MONITOR: J-8C214483 .....                            | 4-5  |
| 4.2  | D.90 C2 AIR ADAPTER WITH VALVE: J-8C214702 (J-8C214702-H: DTH) .....  | 4-7  |
| 4.3  | D.90 C2 DTH NOZZLES HOLDER: J-8C214461 .....                          | 4-9  |
| 4.4  | D.114 C2 NOZZLES HOLDER: J-1C212483 .....                             | 4-11 |
| 4.5  | D.114 C2 AIR ADAPTER WITH VALVE: J-1C212702 (J-1C212702-H: DTH) ..... | 4-13 |
| 4.6  | D.114 C2 DTH GROUT MASTER 5" NOZZLES HOLDER XL: J-1C212461-XL .....   | 4-15 |
| 4.7  | D.114 C2H JET NOZZLES HOLDER: J-1C2H4000 .....                        | 4-17 |
| 4.8  | D.114 C2 RP NOZZLES HOLDER: J-1C2RP400 .....                          | 4-19 |
| 4.9  | D.127 C2 NOZZLES HOLDER: J-12C20483 .....                             | 4-21 |
| 4.10 | D.127 C2 NOZZLES HOLDER ADAPTER WITH VALVE: J-12C20702 .....          | 4-23 |
| 4.11 | D.140 C2 NOZZLES HOLDER: J-14C20483 .....                             | 4-25 |
| 4.12 | D.140 C2 NOZZLES HOLDER ADAPTER WITH VALVE: J-14C20702 .....          | 4-27 |
| 4.13 | D.114 T3/C3 NOZZLES HOLDER J-W114K340 .....                           | 4-29 |
| 4.14 | D.127 K3 NOZZLES HOLDER: J-12K34000 .....                             | 4-31 |
| 4.15 | D.127 BIT ADAPTER: J-12C20752 .....                                   | 4-33 |
| 4.16 | D.114 C2 NOZZLES HOLDER PLUS TYPE: J-1C212483-P .....                 | 4-35 |
| 4.17 | S.T.R.A.JET STEP IV NOZZLES HOLDER: J-1C212470-4 .....                | 4-37 |
| 4.18 | S.T.R.A.JET XL NOZZLE HOLDER: J-1C212470-XL .....                     | 4-41 |
| 4.19 | S.T.R.A.JET BF NOZZLE HOLDER: J-1C212472-IV .....                     | 4-45 |
| 4.20 | C2H HEX 80 (2x150° + 2x90°) NOZZLES HOLDER: J-EC2H4000 .....          | 4-49 |
| 4.21 | C2H HEX 80 BIT ADAPTER: J-EC2H5000 .....                              | 4-53 |
| 4.22 | S.T.R.A.JET XL NOZZLE HOLDER (DOUBLE NOZZLE) .....                    | 4-57 |
| 4.23 | D.90 S.T.R.A.JET XS SINGLE FLUID NOZZLE HOLDER .....                  | 4-61 |
| 4.24 | D.114 S.T.R.A.JET XS DOUBLE FLUID NOZZLE HOLDER .....                 | 4-65 |
| 4.25 | S.T.R.A.JET XS DOUBLE FLUID NOZZLE HOLDER (DOUBLE NOZZLE) .....       | 4-69 |
| 4.26 | BIT ADAPTER C2 D.90 WITH NO RETURN VALVE J-8C214753 .....             | 4-73 |
| 4.27 | BIT ADAPTER C2 D.114 WITH NO RETURN VALVE J-1C212752 .....            | 4-77 |

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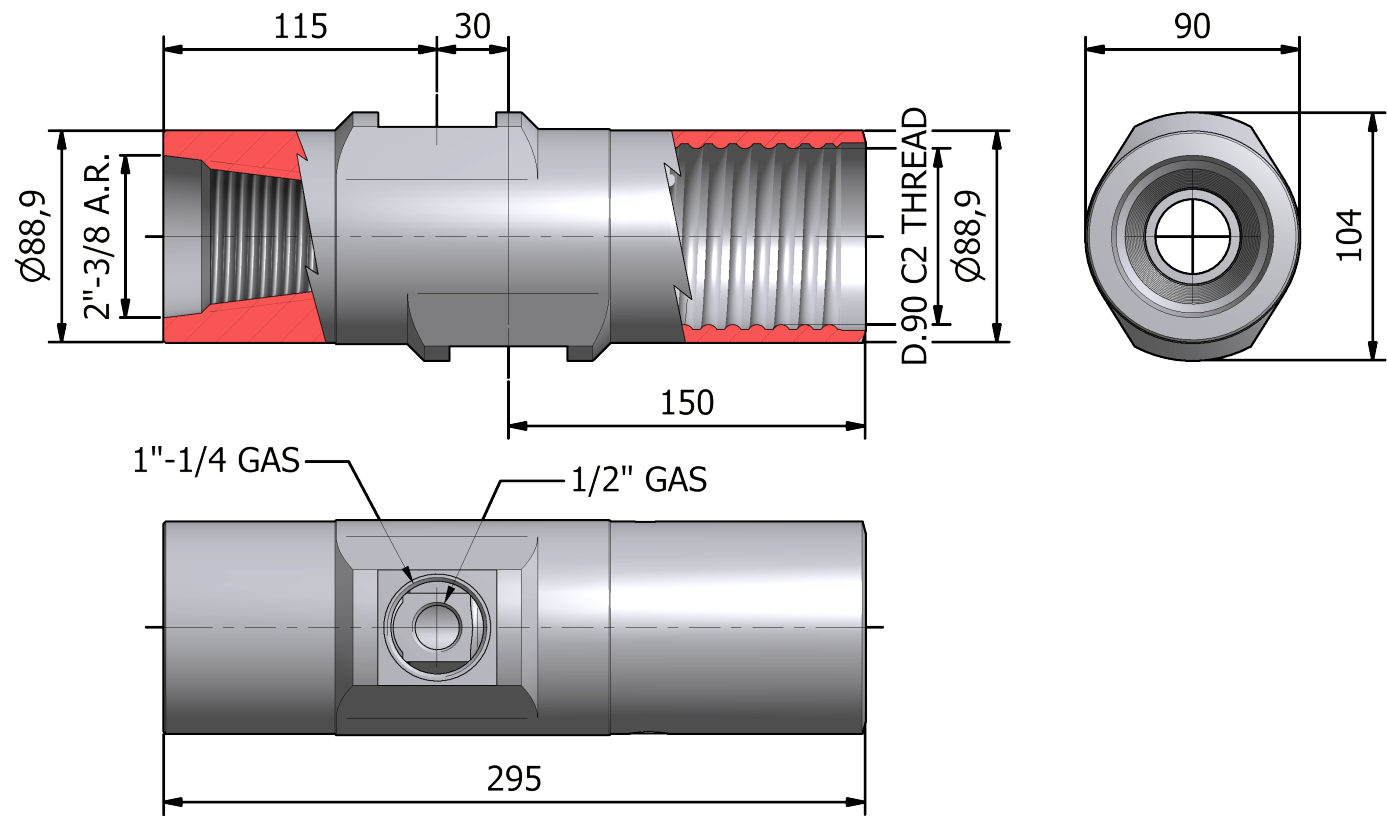
4.1 D.90 C2 STANDARD MONITOR: J-8C214483



FIG. 4.1

J-8C214483 (REF. FIG. 4.1)

| REF. No. | CODICE CODE | DESCRIZIONE                 | DESCRIPTION                | QTY | NOTE |
|----------|-------------|-----------------------------|----------------------------|-----|------|
| 1        | J-8C214483  | CORPO MONITOR D.90 C2       | D.90 C2 NOZZLE HOLDER BODY | 1   |      |
| 2        | J-8C214484  | GUARNIZIONE MONITOR D.90 C2 | D.90 C2 NOZZLE HOLDER SEAL | 1   |      |



4.2 D.90 C2 AIR ADAPTER WITH VALVE: J-8C214702 (J-8C214702-H: DTH)

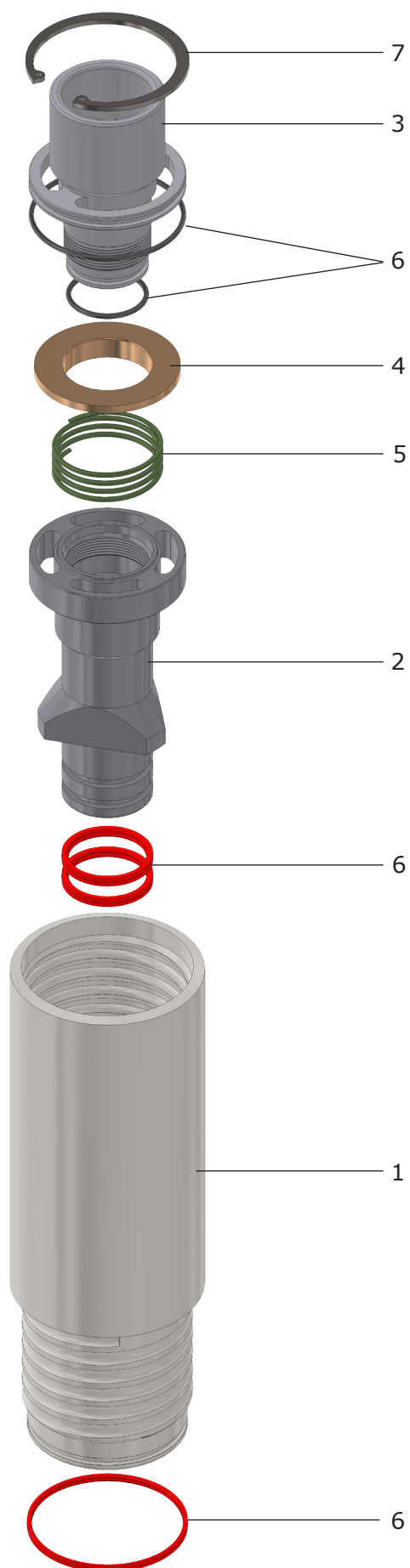
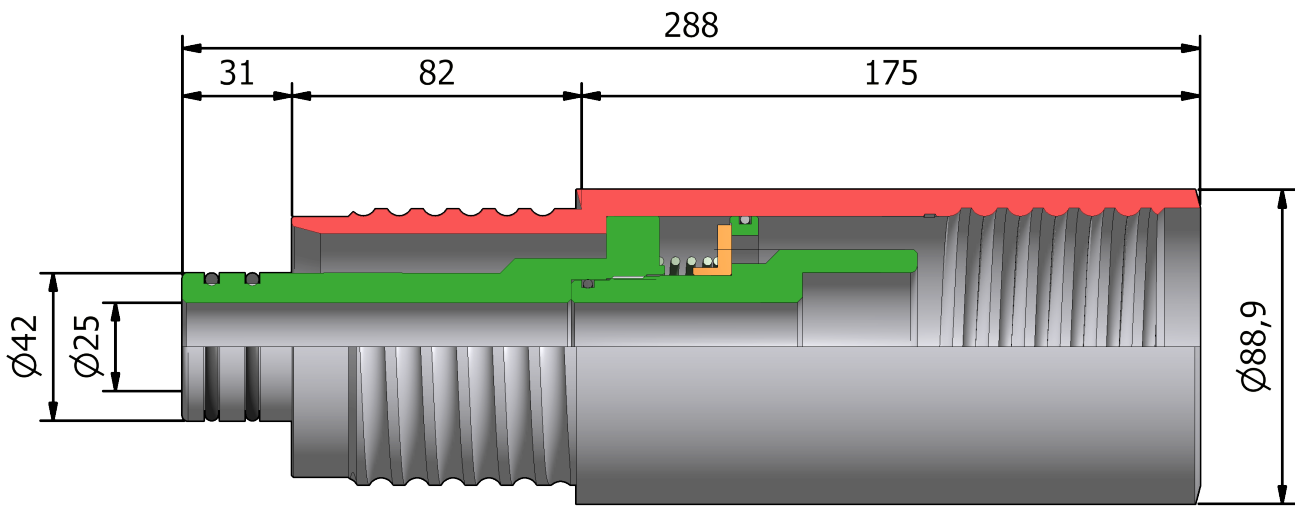


FIG. 4.2

J-8C214702 (REF. FIG. 4.2)

| REF. No. | CODICE CODE | DESCRIZIONE                       | DESCRIPTION                    | QTY | NOTE |
|----------|-------------|-----------------------------------|--------------------------------|-----|------|
| 1        | J-8C214708  | CORPO EST. RACC. VALV. D.90 C2    | D.90 C2 AIR ADAPTER EXT. BODY  | 1   | (2)  |
| 2        | J-8C214705  | CORPO INT. RACC. VALV. D.90 C2    | D.90 C2 AIR ADAPTER INNER BODY | 1   |      |
| 3        | J-8C214704  | PORTA VALVOLA D.90 C2             | D.90 C2 VALVE HOUSING          | 1   |      |
| 4        | J-8C214707  | VALVOLA D.90 C2                   | D.90 C2 VALVE                  | 1   |      |
| 5        | J-8C214706  | MOLLA RACC. VALV. 2,5x51 H20      | 2,5x51 H20 VALVE SPRING        | 1   |      |
| 6        | J-8C214703  | KIT GUARN. RACC. VALV. D.90 C2    | D.90 C2 AIR ADAPTER SEALS KIT  | 1   | (1)  |
| 7        | 7437D72S25  | ANELLO EL. PER FORI D.72 UNI 7437 | UNI 7437 D.72 ELASTIC RING     | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY  
(2) J-8C214708-H VERSIONE PER DTH - J-8C214708-H DTH VERSION



4.3 D.90 C2 DTH NOZZLES HOLDER: J-8C214461

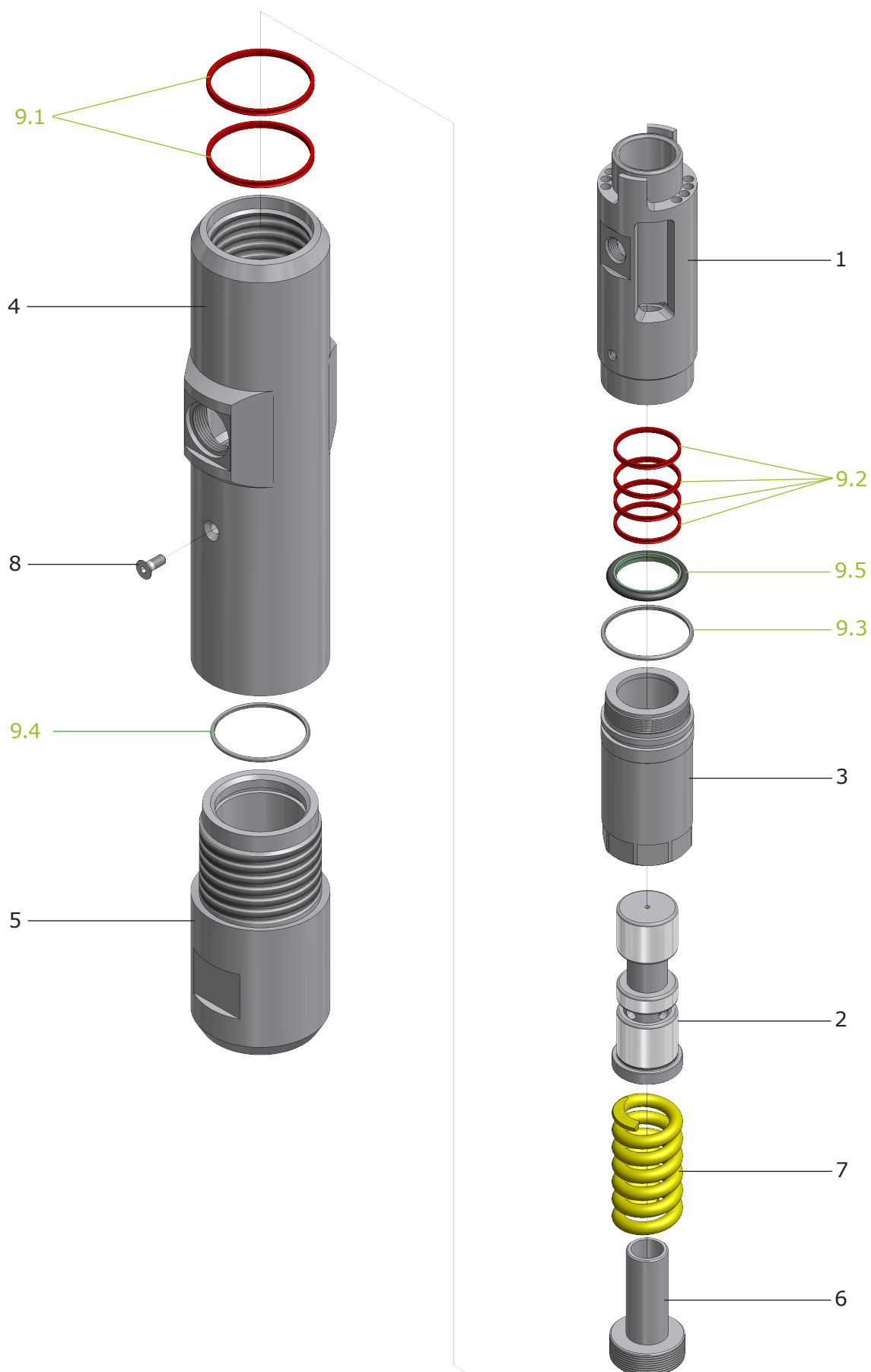
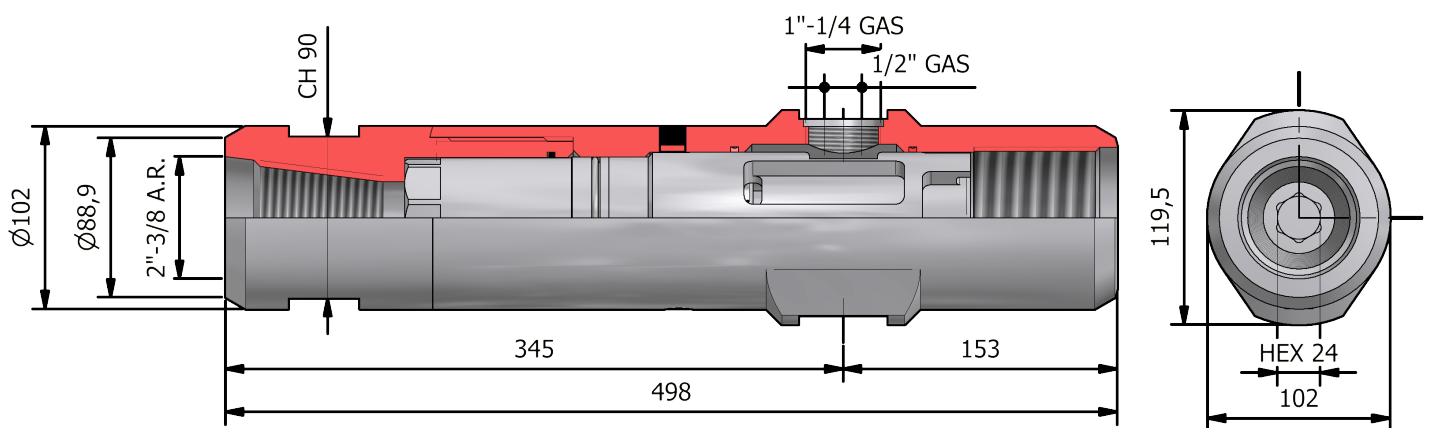


FIG. 4.3

J-8C214461 (REF. FIG. 4.3)

| REF. No. | CODICE CODE        | DESCRIZIONE                        | DESCRIPTION                   | QTY | NOTE |
|----------|--------------------|------------------------------------|-------------------------------|-----|------|
| 1        | D-1255-1           | CORPO INTERNO MONITOR DTH          | DTH NOZZLES H. INNER BODY     | 1   |      |
| 2        | D-1255-2           | SELETTORE INTERNO MONITOR DTH      | DTH NOZ. H. INNER DISTRIBUTOR | 1   |      |
| 3        | D-1255-3           | PORTA MOLLA MONITOR DTH            | DTH NOZZLES H. SPRING HOUSING | 1   |      |
| 4        | D-1255-4           | CORPO ESTERNO MONITOR DTH          | DTH NOZZLES H. EXTERNAL BODY  | 1   |      |
| 5        | D-1255-5           | CORPO EST. INF. MONITOR DTH        | DTH N. H. EXTERNAL LOWER BODY | 1   |      |
| 6        | D-1255-6           | BATTUTA PORTA MOLLA                | SPRING RETAINER               | 1   |      |
| 7        | D-1255-18          | MOLLA Do=52 Lo=105 d=10            | Do=52 Lo=105 d=10 SPRING      | 1   |      |
| 8        | 5933M8X20P125109ZB | VITE TPSEI M8x20 UNI 5933          | M8x20 UNI 5933 SCREW          | 1   |      |
| 9        | J-8C214461-A       | KIT. GUARNIZ. MONITOR C2 DTH       | DTH NOZZLES HOLDER SEALS KIT  | 1   |      |
| 9.1      | D-1255-B           | S35-P 73X79.2L=4.5 H-ECOPUR        | S35-P 73X79.2L=4.5 H-ECOPUR   | 2   | (1)  |
| 9.2      | D-1255-A           | S35-P 45X49.5L=3.5 H-ECOPUR        | S35-P 45X49.5L=3.5 H-ECOPUR   | 4   | (1)  |
| 9.3      | MR-OR229           | OR-229 RIF. POLYPAC                | O-RING-229 REF. POLYPAC       | 1   | (1)  |
| 9.4      | MR-OR231           | OR-231 RIF. POLYPAC                | O-RING-231 REF. POLYPAC       | 1   | (1)  |
| 9.5      | MR-IG/R0450        | GUARNIZIONE IG/R 0450 RIF. POLYPAC | IG/R 0450 SEAL REF. POLYPAC   | 1   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



4.4 D.114 C2 NOZZLES HOLDER: J-1C212483

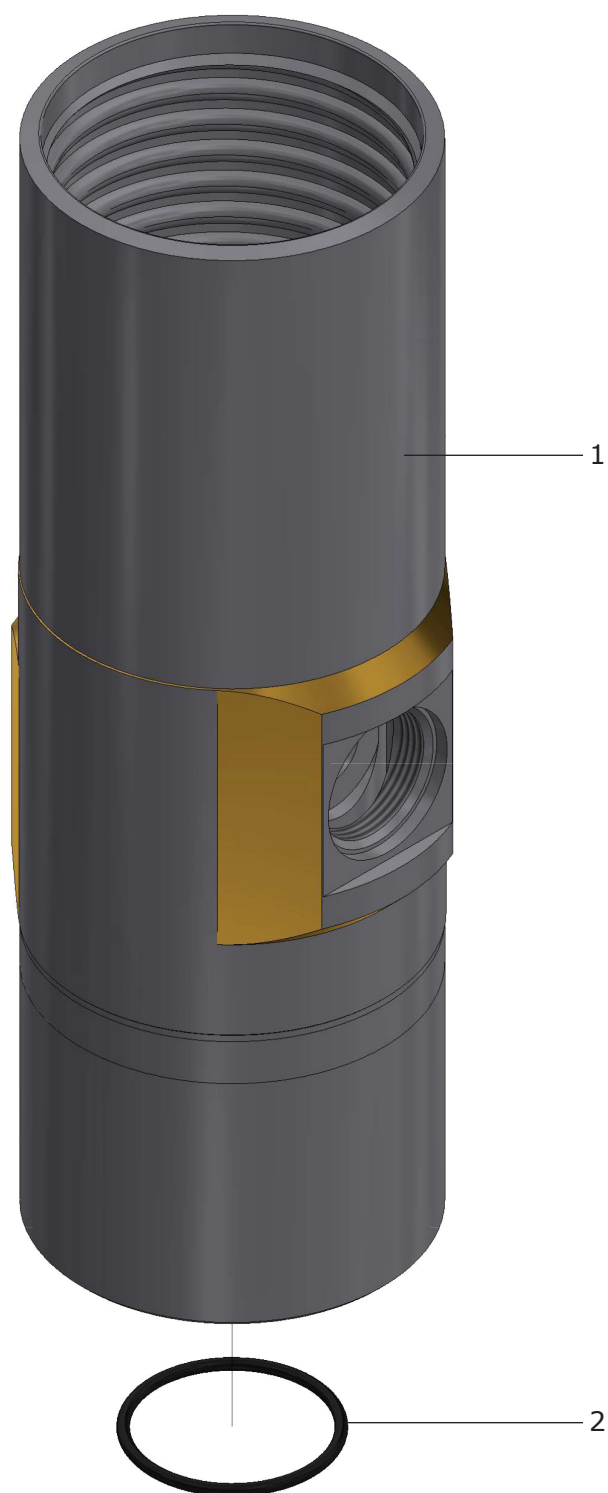
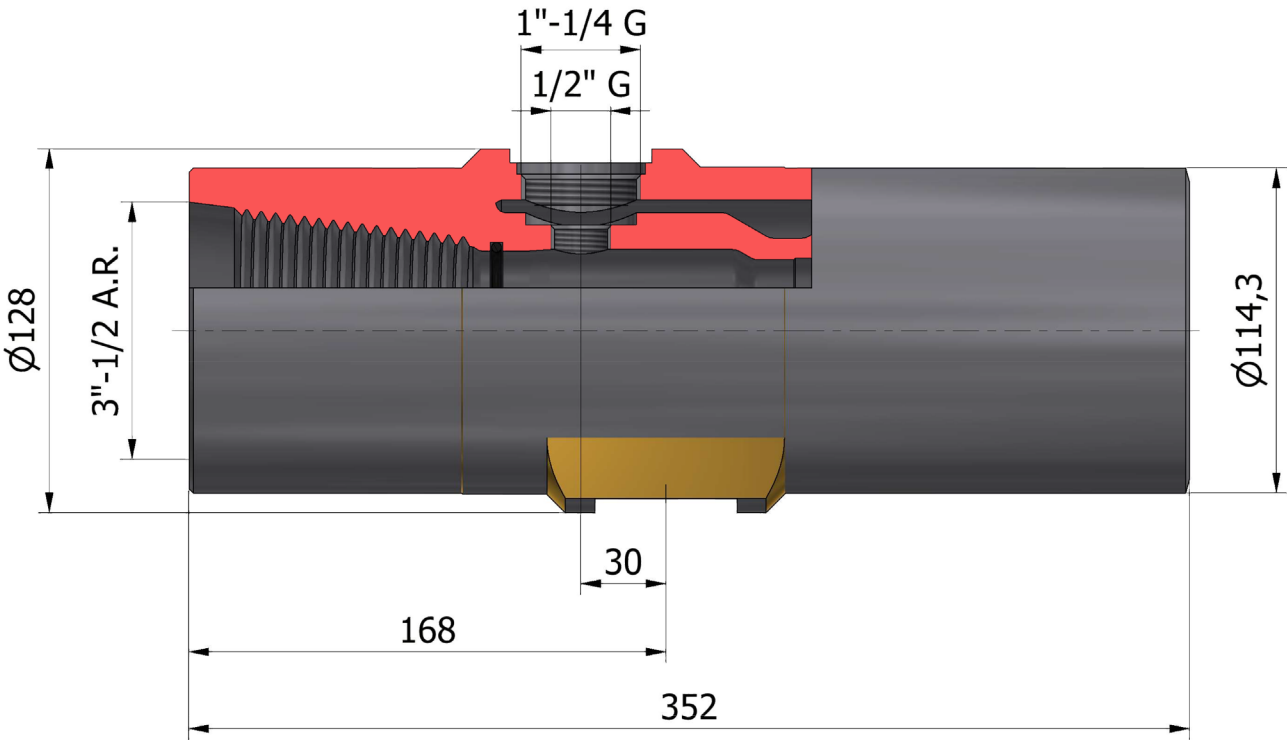


FIG. 4.4

J-1C212483 (REF. FIG. 4.4)

| REF. No. | CODICE CODE | DESCRIZIONE                  | DESCRIPTION                 | QTY | NOTE |
|----------|-------------|------------------------------|-----------------------------|-----|------|
| 1        | J-1C212483  | CORPO MONITOR D.114 C2       | D.114 C2 NOZZLE HOLDER BODY | 1   |      |
| 2        | J-1C212484  | GUARNIZIONE MONITOR D.114 C2 | D.114 C2 NOZZLE HOLDER SEAL | 1   |      |





4.5 D.114 C2 AIR ADAPTER WITH VALVE: J-1C212702 (J-1C212702-H: DTH)

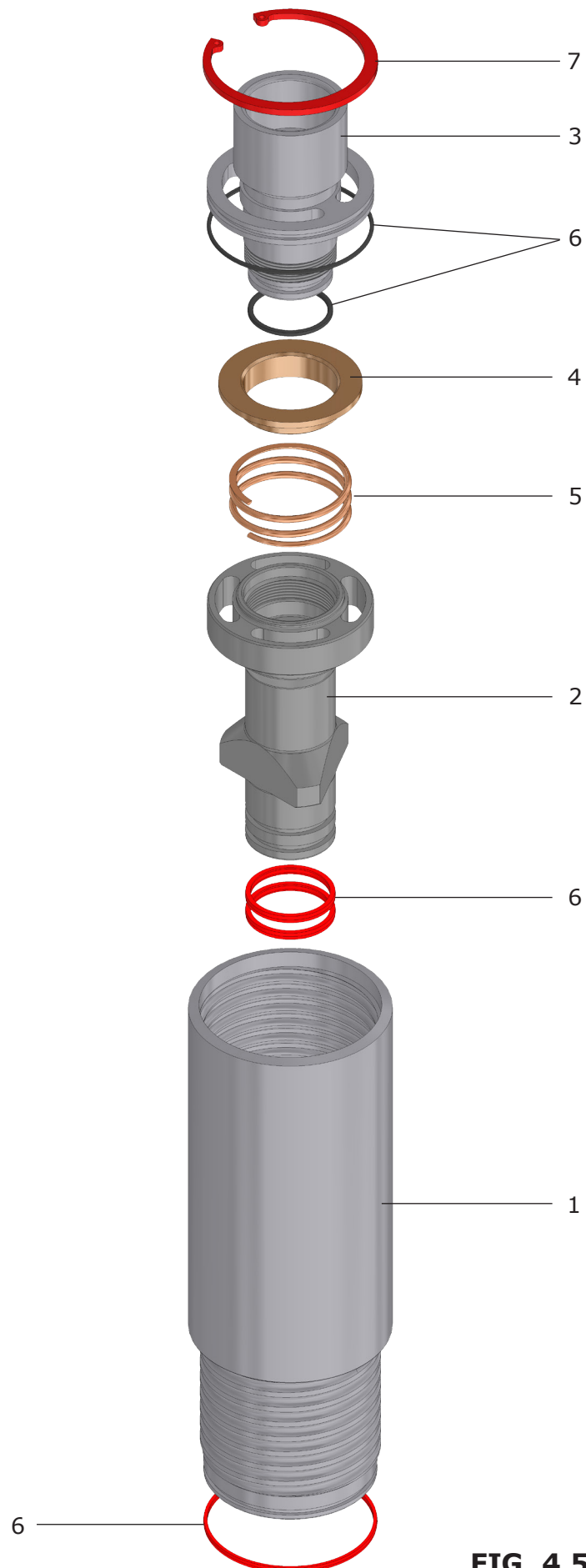
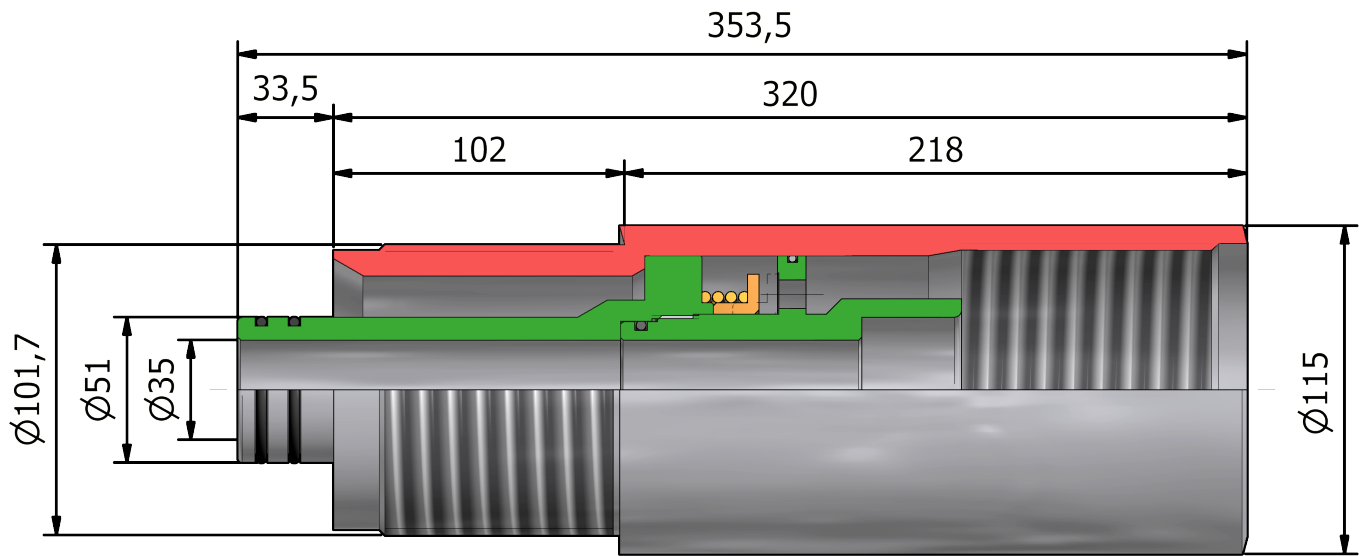


FIG. 4.5

J-1C212702 (REF. FIG. 4.5)

| REF. No. | CODICE CODE | DESCRIZIONE                       | DESCRIPTION                     | QTY | NOTE |
|----------|-------------|-----------------------------------|---------------------------------|-----|------|
| 1        | D-1106/1    | CORPO EST. RACC. VALV. D.114 C2   | D.114 C2 AIR ADAPTER EXT. BODY  | 1   | (2)  |
| 2        | D-1106/2    | CORPO INT. RACC. VALV. D.114 C2   | D.114 C2 AIR ADAPTER INNER BODY | 1   |      |
| 3        | D-1106/3    | PORTA VALVOLA D.114 C2            | D.114 C2 VALVE HOUSING          | 1   |      |
| 4        | D-1106/4    | VALVOLA D.114 C2                  | D.114 C2 VALVE                  | 1   |      |
| 5        | D-1109/2    | MOLLA d=4 Do=69 Lo=28             | d=4 Do=69 Lo=28 SPRING          | 1   |      |
| 6        | J-1C212703  | KIT GUARN. RACC. VALV. D.114 C2   | D.114 C2 AIR ADAPTER SEALS KIT  | 1   | (1)  |
| 7        | 7438D95S4   | ANELLO EL. PER FORI D.95 UNI 7438 | UNI 7438 D.95 ELASTIC RING      | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY  
(2) J-1C212708-H VERSIONE PER DTH - J-1C212708-H DTH VERSION



4.6 D.114 C2 DTH GROUT MASTER 5" NOZZLES HOLDER XL: J-1C212461-XL

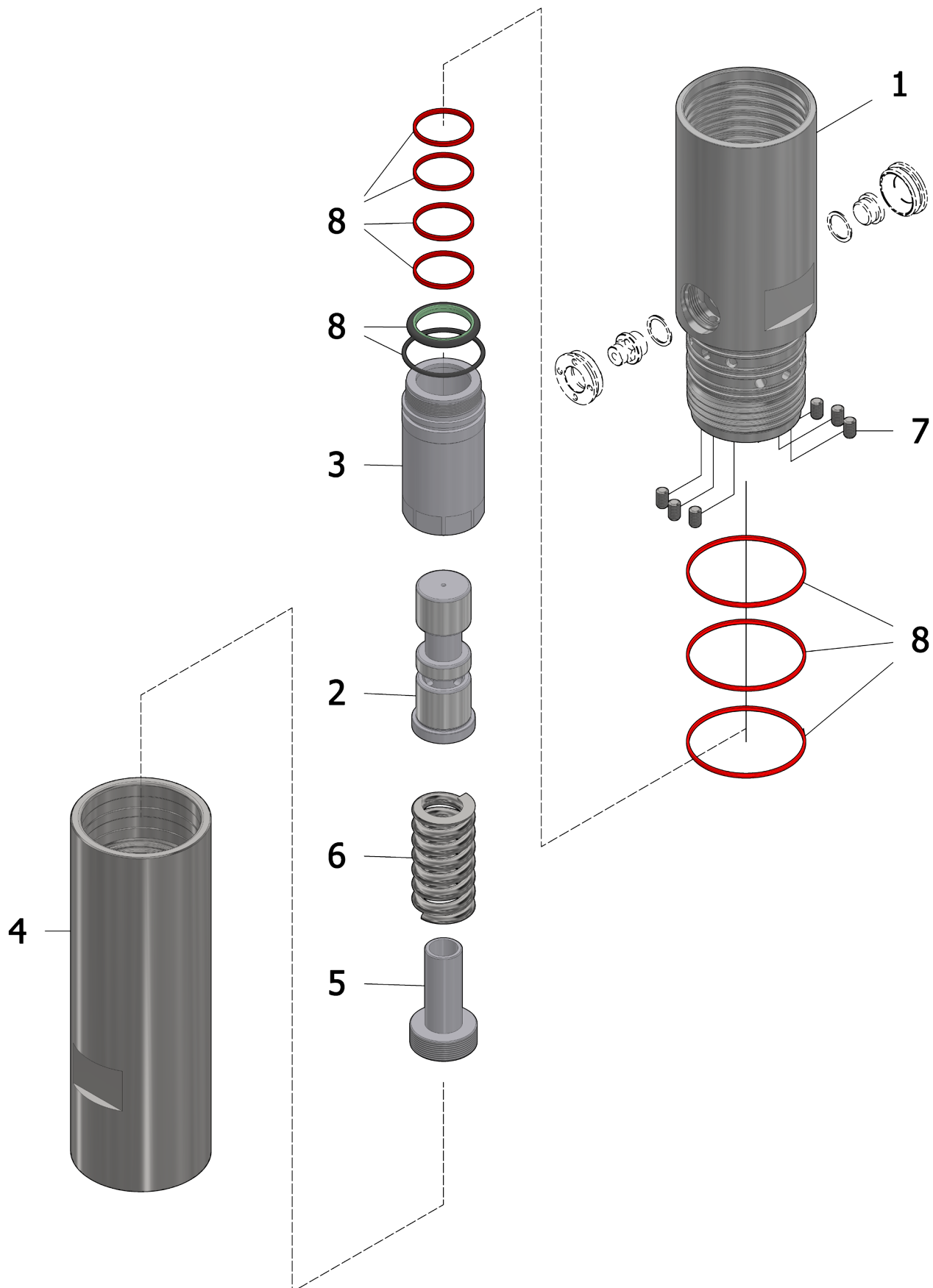
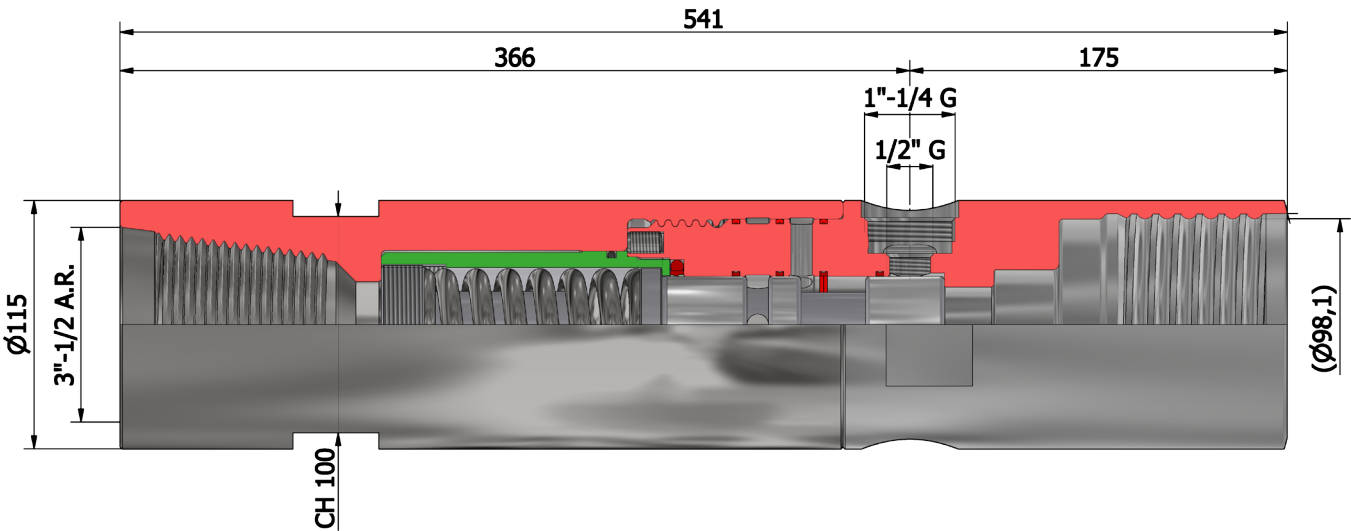


FIG. 4.6

J-1C212461-XL (REF. FIG. 4.6)

| REF. No. | CODICE CODE                  | DESCRIZIONE                        | DESCRIPTION                  | QTY | NOTE |
|----------|------------------------------|------------------------------------|------------------------------|-----|------|
| 1        | D-1255D-1                    | CORPO SUPERIORE MONITOR DTH D.114  | DTH NOZZLE H. XL UPPER BODY  | 1   |      |
| 2        | D-1255-2                     | SELETTORE INTERNO                  | INNER SELECTOR               | 1   |      |
| 3        | D-1255-3                     | PORTAMOLLA                         | SPRING HOUSING               | 1   |      |
| 4        | D-1255D-4                    | CORPO INFERIORE MONITOR DTH D.114  | DTH NOZZLE H. XL LOWER BODY  | 1   |      |
| 5        | D-1255-6                     | BATTUTA PORTAMOLLA                 | SPRING BACKPLATE             | 1   |      |
| 6        | D-1255-18                    | MOLLA Do=52 d=10 Lo=105            | SPRING Do=52 d=10 Lo=105     | 1   |      |
| 7        | UNI 5923 - M10 x 16          | GRANO PUNTA PIANA                  | FLAT HEAD SET SCREW          | 6   |      |
| 8        | J-1C212461-AXL               | KIT GUARNIZIONI MONITOR DTH XL     | DTH NOZZLE H. XL SEALS KIT   | 1   |      |
| 8.1      | S35-P 45x49.5x3.5 (D-1255-A) | GUARNIZIONE POLIURETANO 95 SHORE-A | POLYURETHANE 95 SHORE-A SEAL | 4   | (1)  |
| 8.2      | K35-P 93,4x97,9x3,5          | GUARNIZIONE POLIURETANO 95 SHORE-A | POLYURETHANE 95 SHORE-A SEAL | 3   | (1)  |
| 8.3      | IG-R0450                     | GUARNIZIONE IG/R                   | IG/R TYPE SEAL               | 1   | (1)  |
| 8.4      | OR 229                       | O-RING                             | O-RING SEAL                  | 1   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



4.7 D.114 C2H JET NOZZLES HOLDER: J-1C2H4000

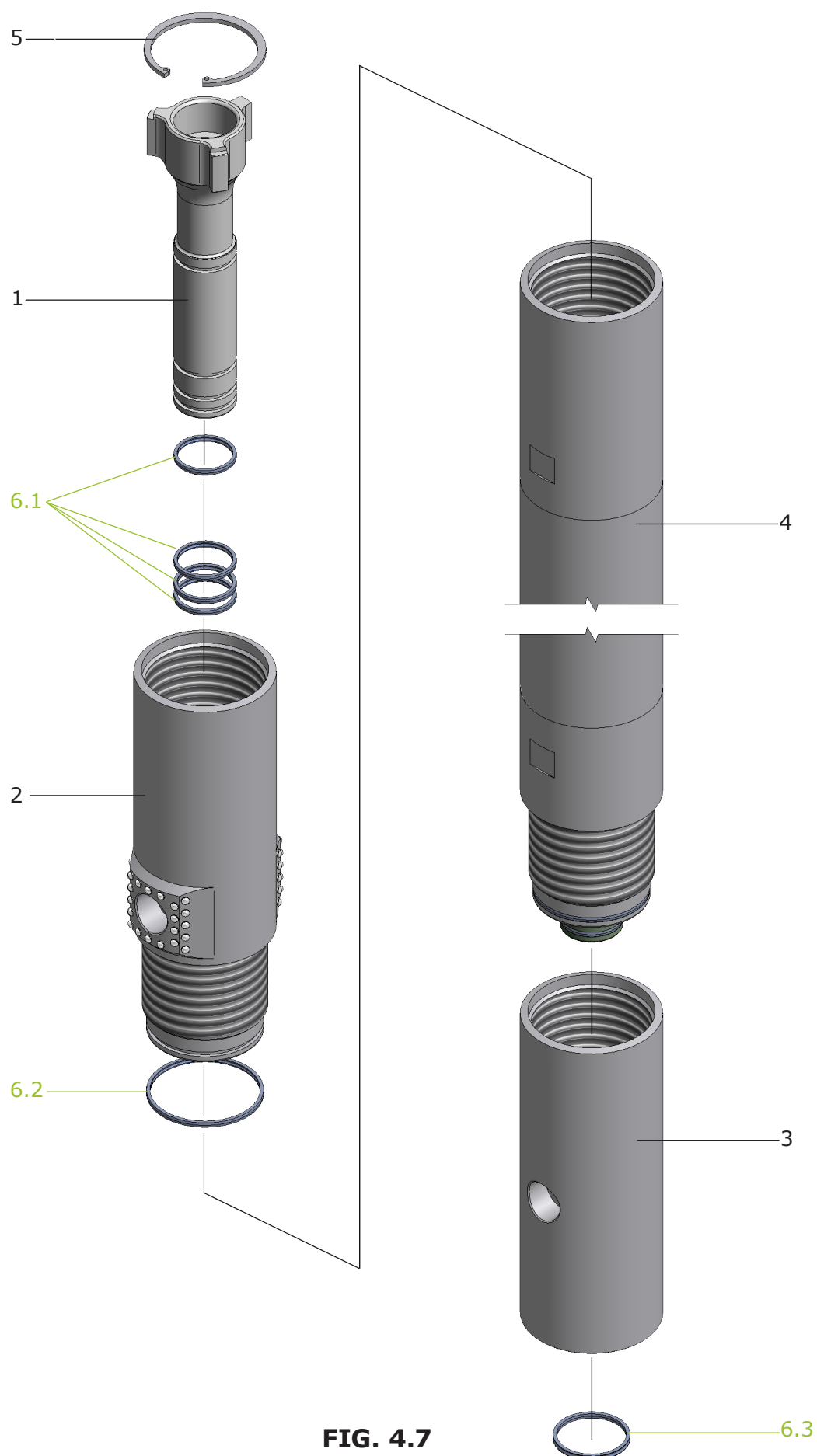
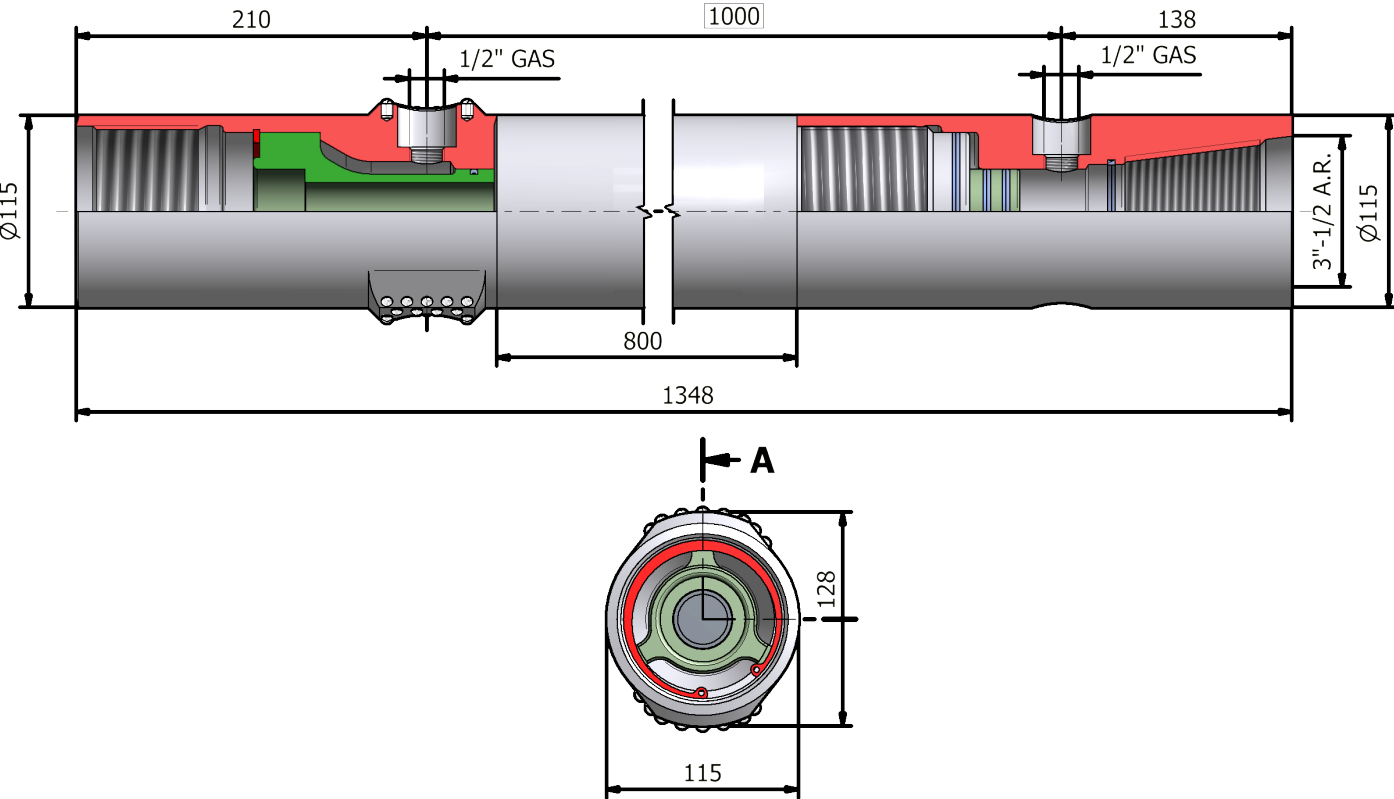


FIG. 4.7

J-1C2H4000: C2H JET NOZZLES HOLDER (REF. FIG. 4.7)

| REF. No. | CODICE CODE  | DESCRIZIONE                       | DESCRIPTION                   | QTY | NOTE |
|----------|--------------|-----------------------------------|-------------------------------|-----|------|
| 1        | D-1439-3-1   | MANICOTTO INTERNO ACQUA           | WATER INNER COUPLING          | 1   |      |
| 2        | D-1439-3-2   | MONITOR ACQUA                     | WATER NOZZLES HOLDER          | 1   |      |
| 3        | D-1439-3-3   | MONITOR CEMENTO                   | GROUT NOZZLES HOLDER          | 1   |      |
| 4        | D-1439-6     | ASTA COLLEGAMENTO L=800           | L=800 CONNECTION ROD          | 1   |      |
| 5        | 7438D95S4    | ANELLO ELASTICO FORO D.95 (SP.4)  | ELASTIC RING D.95 HOLE (4 TH) | 1   |      |
| 6        | J-1C212470-A | KIT GUARNIZIONI                   | SEALS KIT                     | 1   |      |
| 6.1      | D-1439-A     | GUARN. T-ECOPUR K35P 44.8x51x4.5  | D-1439-A                      |     | (1)  |
| 6.2      | D-1439-B     | GUARN. T-ECOPUR K35P 88.8x95x4.5  | D-1439-B                      |     | (1)  |
| 6.3      | D-1439-C     | GUARN. H-ECOPUR S35-P 56x62.2x4.5 | D-1439-C                      |     | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



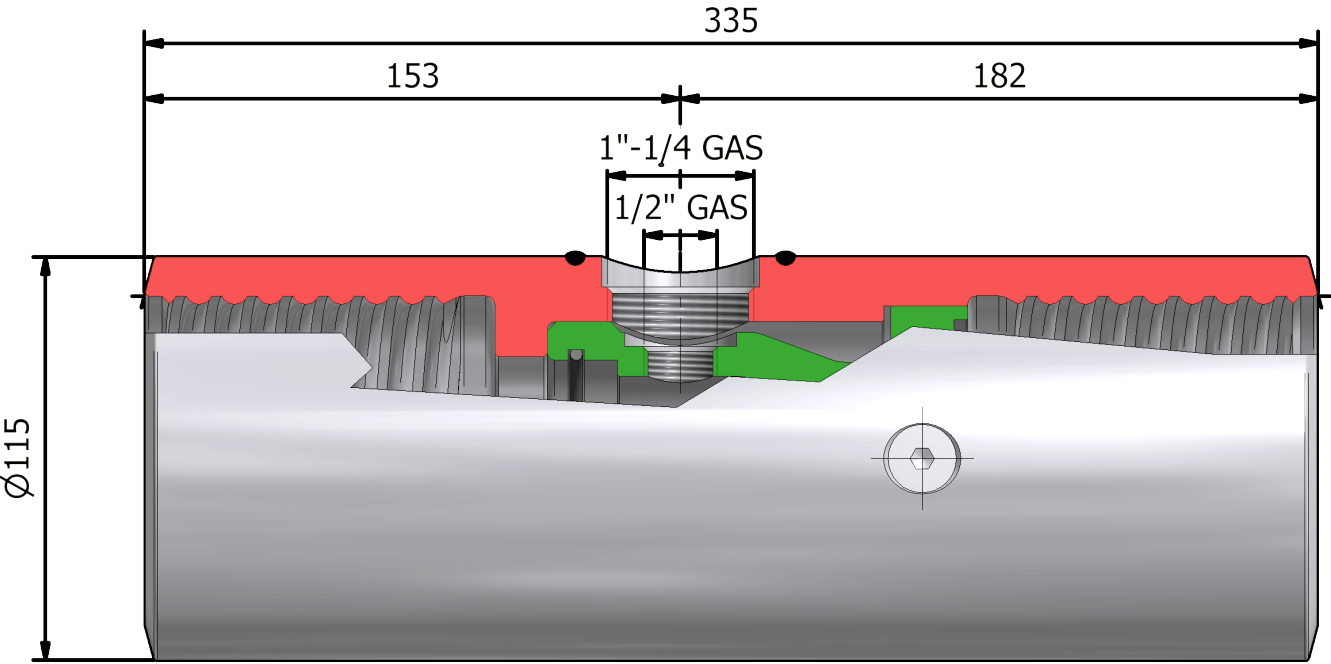
4.8 D.114 C2 RP NOZZLES HOLDER: J-1C2RP400



FIG. 4.8

J-1C2RP400: C2 RP NOZZLES HOLDER (REF. FIG. 4.8)

| REF. No. | CODICE CODE        | DESCRIZIONE                     | DESCRIPTION                      | QTY | NOTE |
|----------|--------------------|---------------------------------|----------------------------------|-----|------|
| 1        | D-1571-7-2         | CORPO EST. MONITOR D.114 C2 RP  | D.114 C2 RP NOZ. HOLD. EXT. BODY | 1   |      |
| 2        | D-1571-7-1         | ADATT. INT. MONITOR D.114 C2 RP | D.114 C2 RP NOZ. H. INNER ADAPT. | 1   |      |
| 3        | J-1C2RP404         | GUARNIZIONE MONITOR D.114 C2 RP | D.114 C2 RP NOZ. HOLDER SEAL     | 1   |      |
| 4        | 5933M10X25P15109ZB | VITE TPSEI M10x25 UNI 5933      | UNI 5933 M10x25 SCREW            | 1   |      |





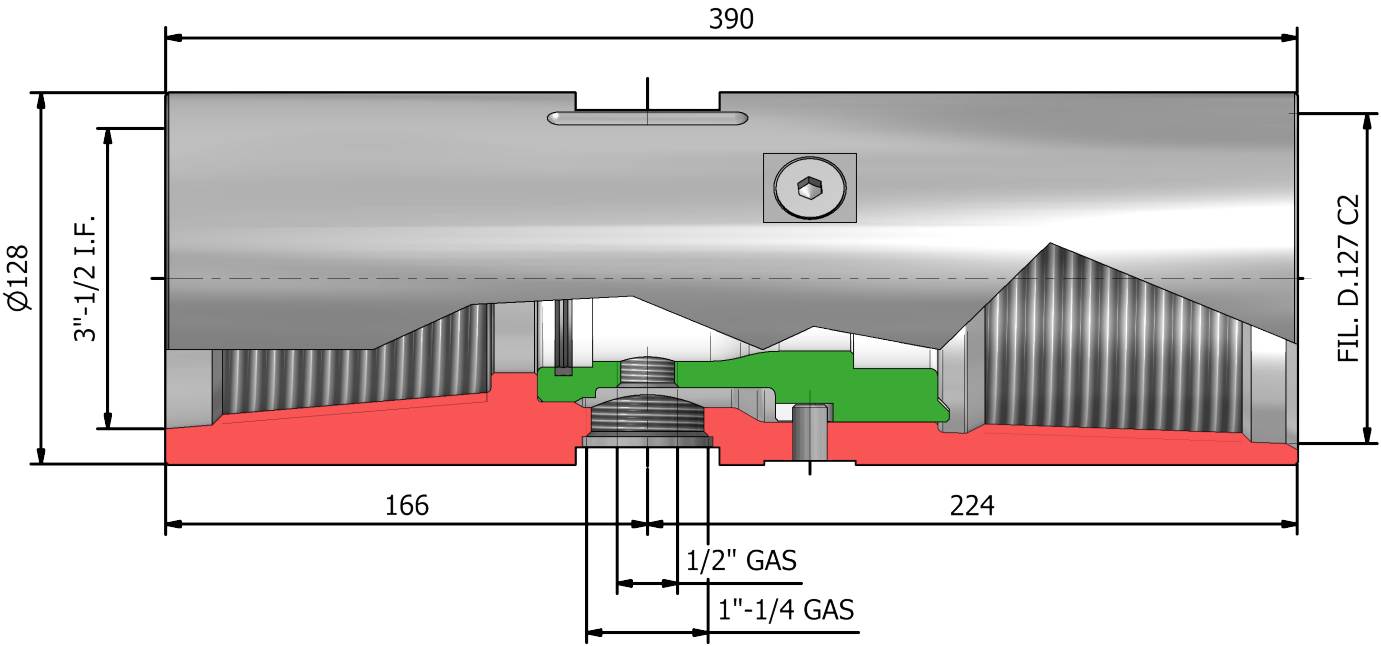
4.9 D.127 C2 NOZZLES HOLDER: J-12C20483



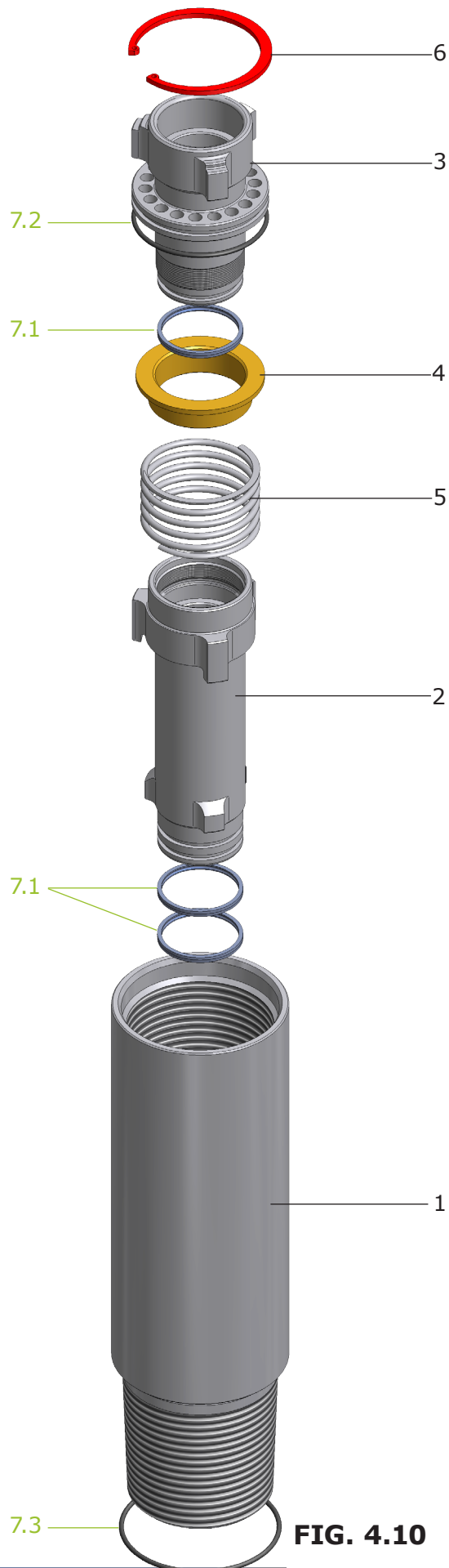
FIG. 4.9

J-12C20483: D.127 C2 NOZZLES HOLDER (REF. FIG. 4.9)

| REF. No. | CODICE CODE         | DESCRIZIONE                   | DESCRIPTION                   | QTY | NOTE |
|----------|---------------------|-------------------------------|-------------------------------|-----|------|
| 1        | D-1354-100-2        | CORPO EST. MONITOR D.127 C2   | D.127 C2 NOZ. HOLD. EXT. BODY | 1   |      |
| 2        | D-1354-100-1        | ADATT. INT. MONITOR D.127 C2  | D.127 C2 NOZ. H. INNER ADAPT. | 1   |      |
| 3        | J-12C20484          | R15-P 60.8x67x5.9 (D-0604-12) | D.127 C2 NOZ. HOLDER SEAL     | 1   |      |
| 4        | 5933M12X25P175109ZB | VITE TPSEI M12x25 UNI 5933    | UNI 5933 M12x25 SCREW         | 1   |      |



4.10 D.127 C2 NOZZLES HOLDER ADAPTER WITH VALVE: J-12C20702

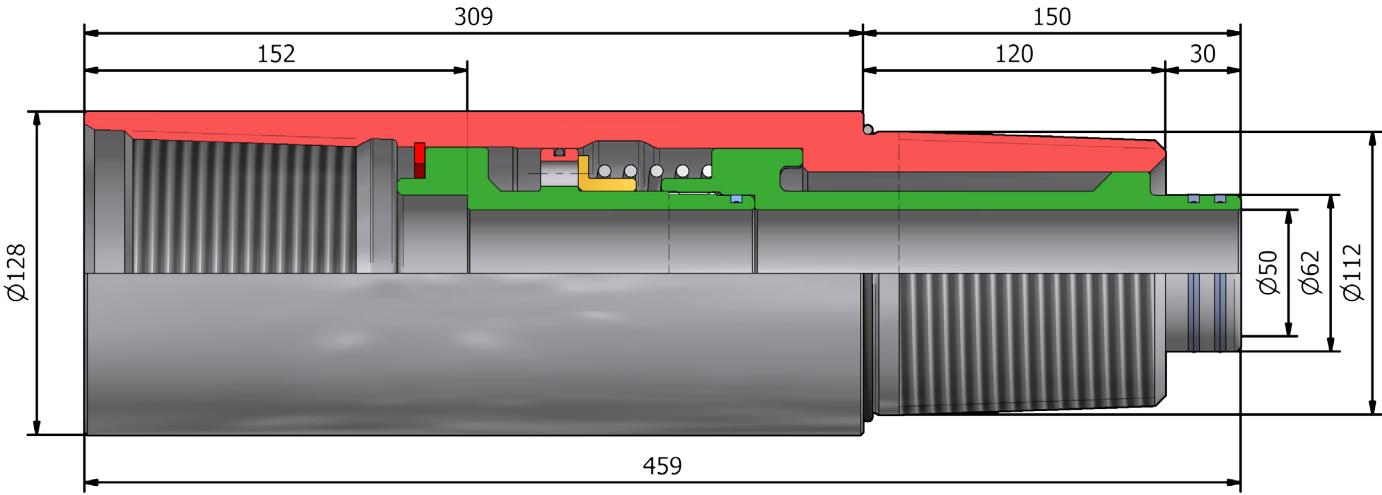


**FIG. 4.10**

J-12C20702: D.127 C2 NOZZLES HOLDER ADAPTER WITH VALVE (REF. FIG. 4.10)

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION                       | QTY | NOTE |
|----------|--------------|-------------------------------------|-----------------------------------|-----|------|
| 1        | D-1354-300-1 | C. EST. MONITOR ADAPT. D.127 C2     | D.127 C2 ADAPT. EXTERNAL BODY     | 1   |      |
| 2        | D-1599-6-2   | C. INT. MONITOR ADAPT. D.127 C2     | D.127 C2 ADAPT. INNER BODY        | 1   |      |
| 3        | D-1599-6-3   | PORTAVALV. MONIT. ADAPT. D.127 C2   | D.127 C2 ADAPT. VALVE HOUSING     | 1   |      |
| 4        | D-1599-6-4   | VALVOLA MONITOR ADAPT. D.127 C2     | D.127 C2 ADAPT. VALVE             | 1   |      |
| 5        | D-1599-6-5   | MOLLA MONITOR ADAPT. D.127 C2       | D.127 C2 ADAPT. SPRING            | 1   |      |
| 6        | 7438D100S4   | ANELLO EL. SERIE PESANTE D.100      | HD ELASTIC RING HOLE D.100        | 1   |      |
| 7        | J-12C20703   | KIT GUARN. MONITOR AD. D.127 C2     | D.127 C2 ADAPTER SEALS KIT        | 1   |      |
| 7.1      | D-1354-A     | GUARN. (T- ECOPUR) K35P 55.8x62x4.5 | (T- ECOPUR) K35P 55.8x62x4.5 SEAL | 3   | (1)  |
| 7.2      | MR-OR239     | O-RING                              | O-RING                            | 1   | (1)  |
| 7.3      | MR-OR244     | O-RING (VITON)                      | O-RING (VITON)                    | 1   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



4.11 D.140 C2 NOZZLES HOLDER: J-14C20483

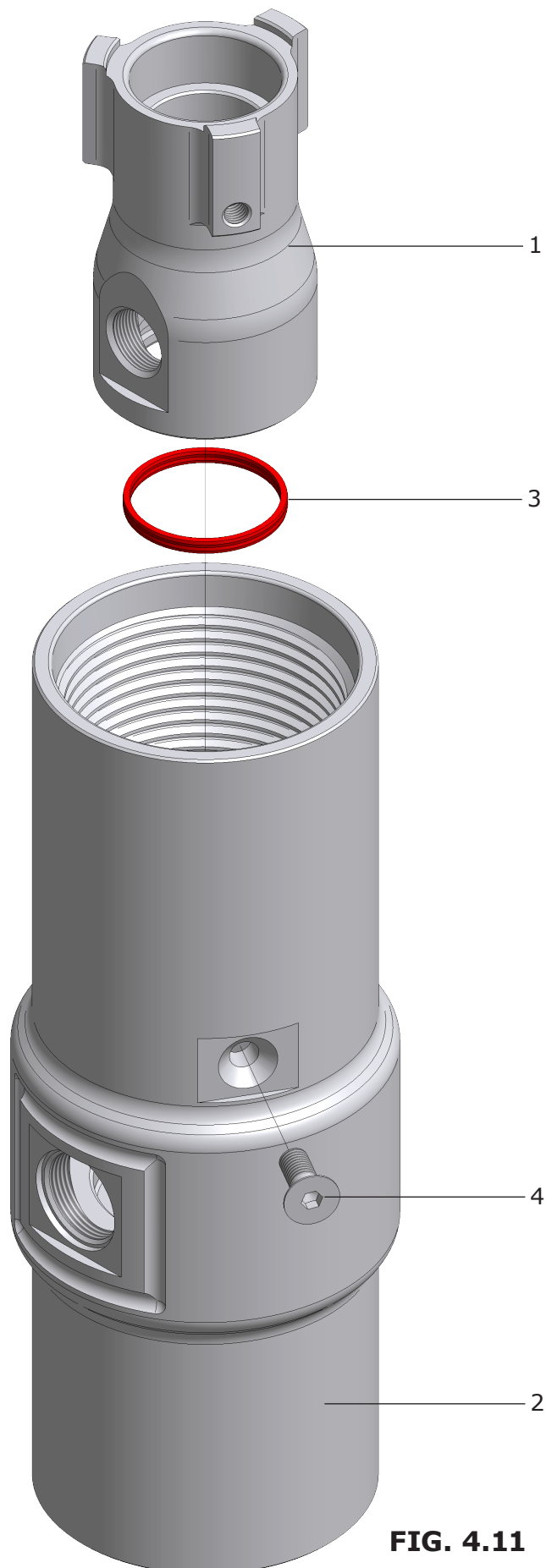
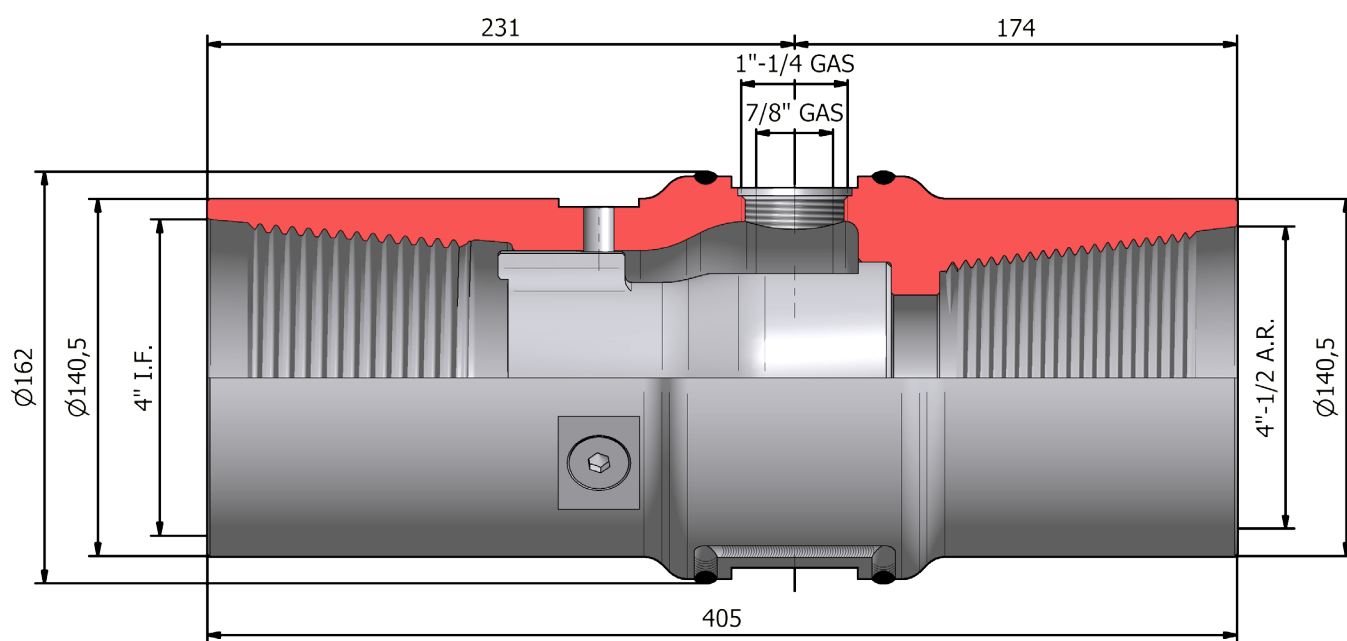


FIG. 4.11

**J-14C20483: D.140 C2 NOZZLES HOLDER (REF. FIG. 4.11)**

| REF. No. | CODICE<br>CODE      | DESCRIZIONE                       | DESCRIPTION                     | QTY | NOTE |
|----------|---------------------|-----------------------------------|---------------------------------|-----|------|
| 1        | D-1599-5-1          | CORPO INTERNO MONITOR D.140 C2    | D.140 C2 N.H. INNER BODY        | 1   |      |
| 2        | D-1599-5-2          | CORPO ESTERNO MONITOR D.140 C2    | D.140 C2 N.H. EXTERNAL BODY     | 1   |      |
| 3        | J-14C20484          | GUARN. H-ECOPUR R15-P 60.8x67x5.9 | H-ECOPUR R15-P 60.8x67x5.9 SEAL | 1   |      |
| 4        | 5933M12X30P175109ZB | VITE TPSEI M12x30                 | VITE TPSEI M12x30               | 1   |      |



4.12 D.140 C2 NOZZLES HOLDER ADAPTER WITH VALVE: J-14C20702

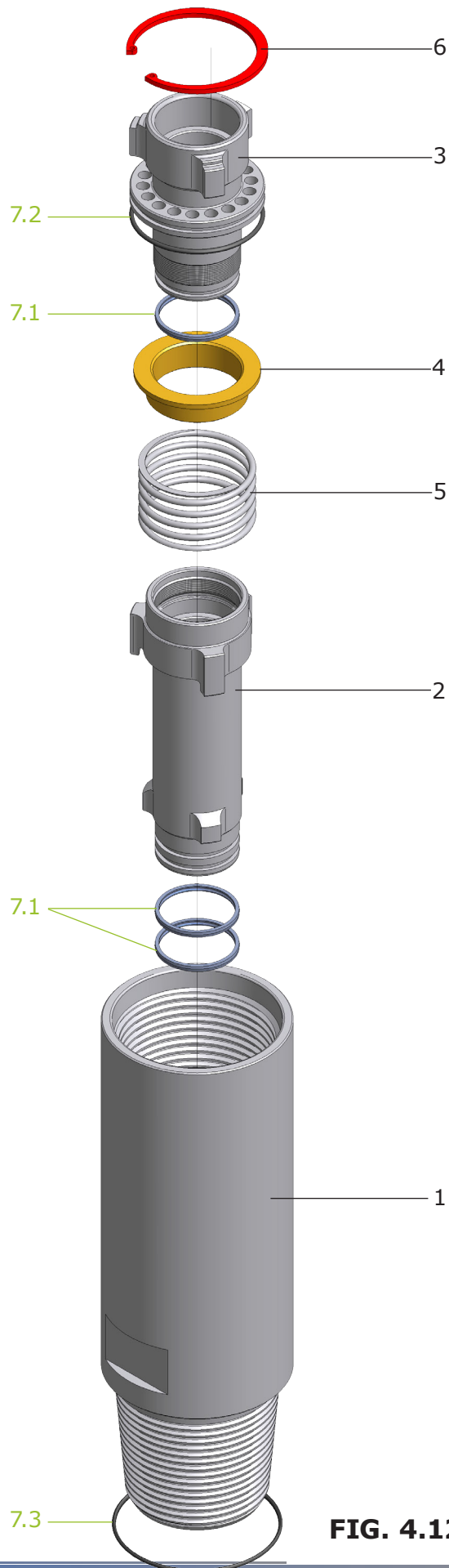
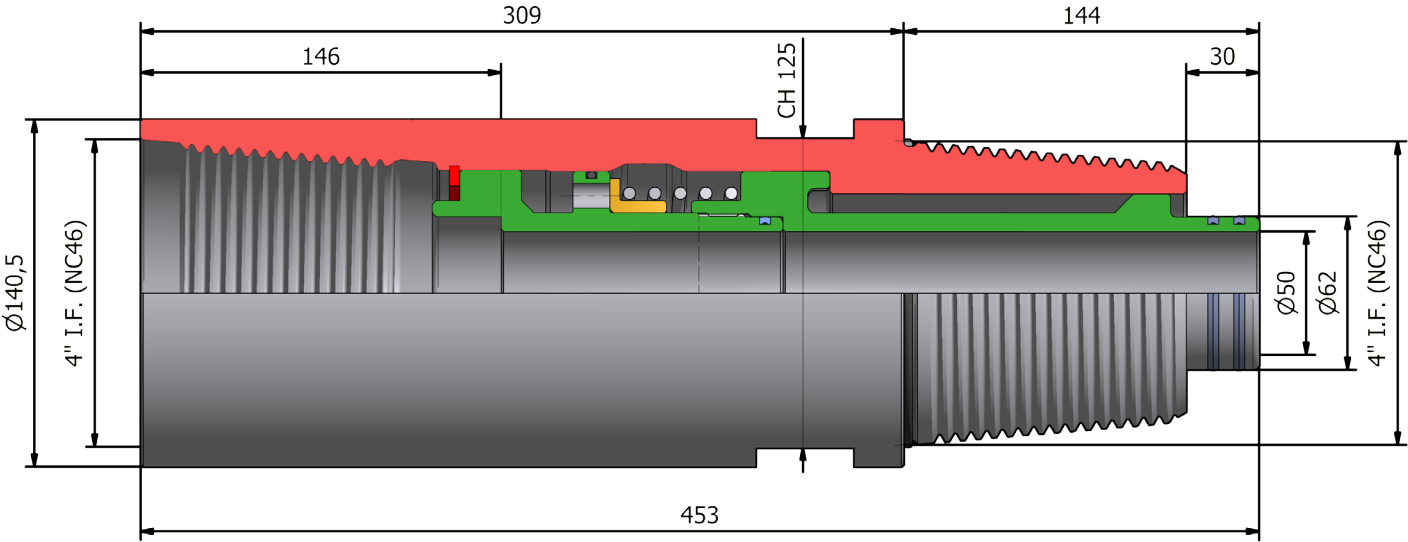


FIG. 4.12

J-14C20702: D.140 C2 NOZZLES HOLDER ADAPTER WITH VALVE (REF. FIG. 4.12)

| REF. No. | CODICE CODE | DESCRIZIONE                         | DESCRIPTION                       | QTY | NOTE |
|----------|-------------|-------------------------------------|-----------------------------------|-----|------|
| 1        | D-1599-6-1  | C. EST. MONITOR ADAPT. D.140 C2     | D.140 C2 ADAPT. EXTERNAL BODY     | 1   |      |
| 2        | D-1599-6-2  | C. INT. MONITOR ADAPT. D.140 C2     | D.140 C2 ADAPT. INNER BODY        | 1   |      |
| 3        | D-1599-6-3  | PORTAVALV. MONIT. ADAPT. D.140 C2   | D.140 C2 ADAPT. VALVE HOUSING     | 1   |      |
| 4        | D-1599-6-4  | VALVOLA MONITOR ADAPT. D.140 C2     | D.140 C2 ADAPT. VALVE             | 1   |      |
| 5        | D-1599-6-5  | MOLLA MONITOR ADAPT. D.140 C2       | D.140 C2 ADAPT. SPRING            | 1   |      |
| 6        | 7438D100S4  | ANELLO EL. SERIE PESANTE D.100      | HD ELASTIC RING HOLE D.100        | 1   |      |
| 7        | J-14C20703  | KIT GUARN. MONITOR AD. D.140 C2     | D.140 C2 ADAPTER SEALS KIT        | 1   |      |
| 7.1      | D-1354-A    | GUARN. (T- ECOPUR) K35P 55.8x62x4.5 | (T- ECOPUR) K35P 55.8x62x4.5 SEAL | 3   | (1)  |
| 7.2      | MR-OR239    | O-RING                              | O-RING                            | 1   | (1)  |
| 7.3      | MR-OR247    | O-RING (VITON)                      | O-RING (VITON)                    | 1   | (1)  |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY





4.13 D.114 T3/C3 NOZZLES HOLDER J-W114K340

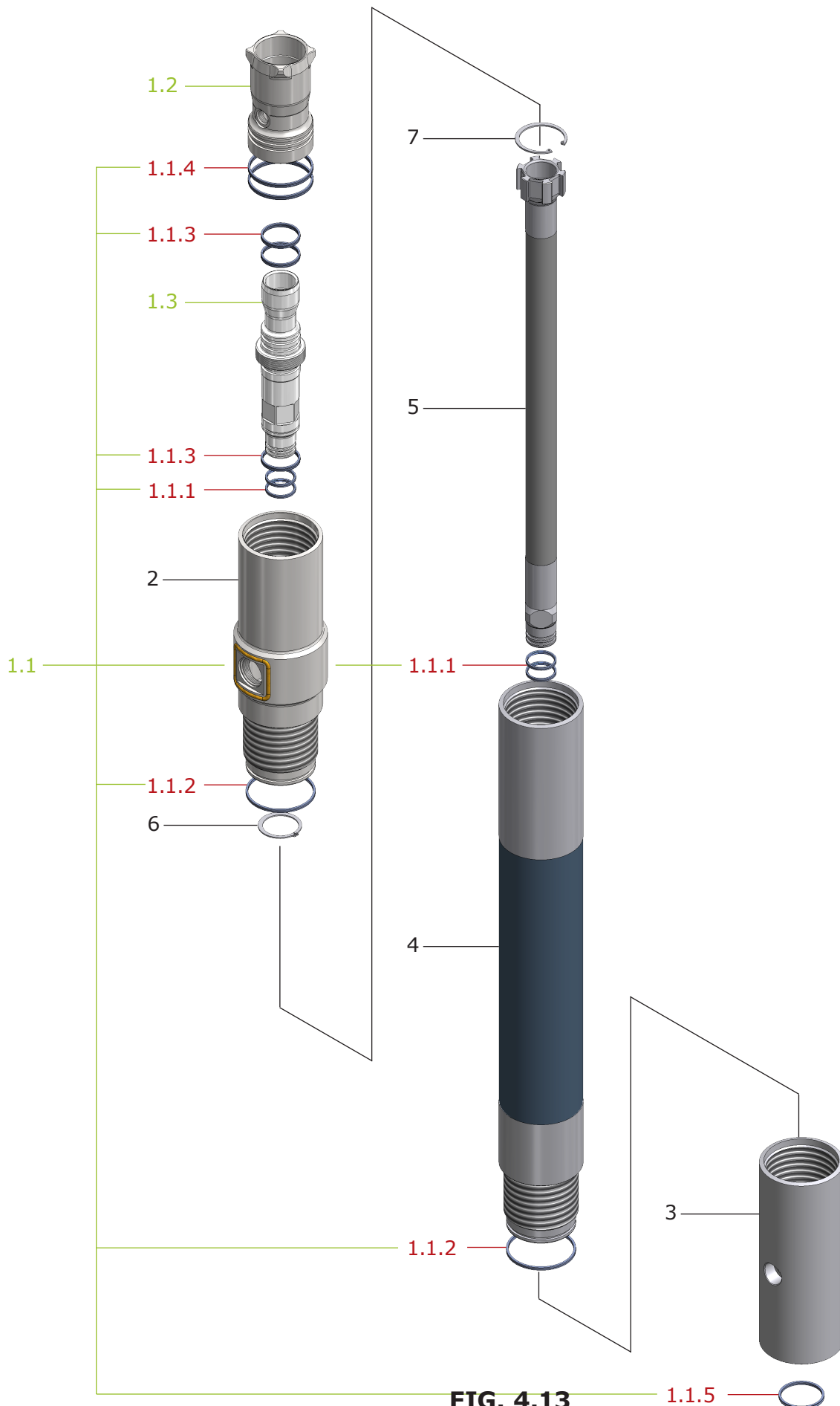


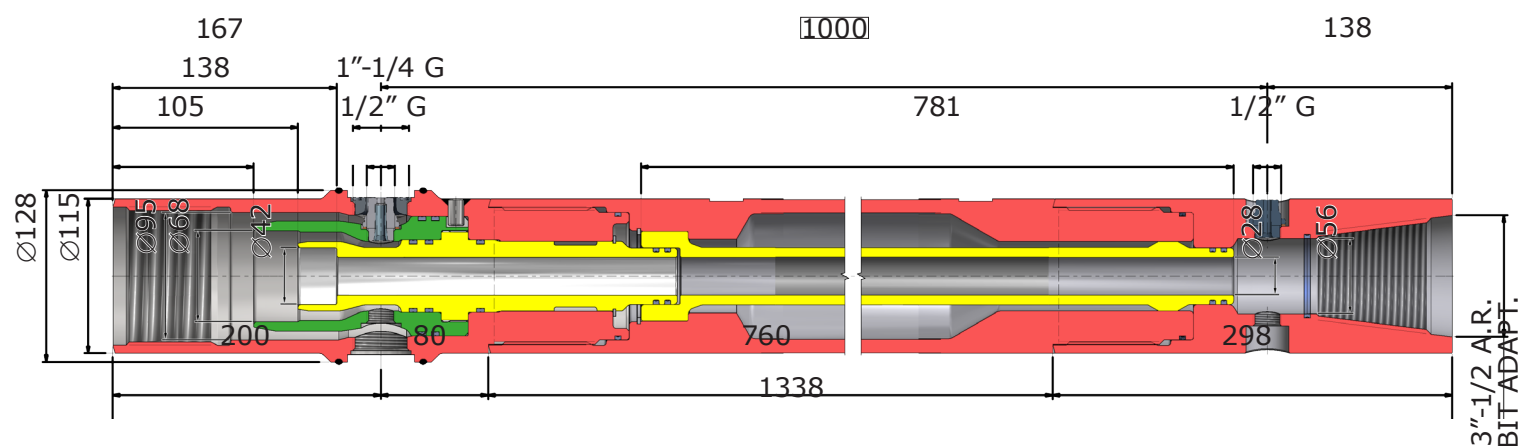
FIG. 4.13

1.1.5

**J-W114K340 D.114 T3 NOZZLES HOLDER (REF. FIG. 4.13)**

| REF. No. | CODICE CODE  | DESCRIZIONE                         | DESCRIPTION                  | QTY | NOTE |
|----------|--------------|-------------------------------------|------------------------------|-----|------|
| 1        | J-W114K341   | KIT RICAMBI MONITOR D.114 T3        | NOZZLES H. SPARE PARTS KIT   | 1   |      |
| 1.1      | J-W114K342   | KIT GUARNIZIONI MONITOR D.114 T3    | NOZZLES HOLDER SEALS KIT     | 1   |      |
| 1.1.1    | D-1731-20-C  | K35-P 35.8x42 L=4.5 T-ECOPUR        | K35-P 35.8x42 L=4.5 T-ECOPUR | 4   | (1)  |
| 1.1.2    | D-1439-B     | K35P 88.8x95 L=4.5 T-ECOPUR         | K35P 88.8x95 L=4.5 T-ECOPUR  | 2   | (1)  |
| 1.1.3    | D-1171-B     | R15-P 47.8x54 L=5.9 H-ECOPUR        | R15-P 47.8x54 L=5.9 H-ECOPUR | 3   | (1)  |
| 1.1.4    | D-1171-A     | R15-P 82.8x89 L=5.9 H-ECOPUR        | R15-P 82.8x89 L=5.9 H-ECOPUR | 2   | (1)  |
| 1.1.5    | D-1439-C     | S35-P 56x62.2 L=4.5 H-ECOPUR        | S35-P 56x62.2 L=4.5 H-ECOPUR | 1   | (1)  |
| 1.2      | D-1731-10-1  | CORPO INTERMEDIO ARIA-ACQUA         | MIDDLE AIR-WATER BODY        | 1   |      |
| 1.3      | D-1731-10-3  | CORPO INTERNO ARIA-ACQUA            | INNER AIR-WATER BODY         | 1   |      |
| 2        | D-1731-10-2  | CORPO ESTERNO ARIA-ACQUA            | EXTERNAL AIR-WATER BODY      | 1   |      |
| 3        | D-1731-10-4  | MONITOR CEMENTO                     | GROUT NOZZLES HOLDER         | 1   |      |
| 4        | D-1731-10-6  | ASTA ESTERNA MONITOR HP T3          | EXTERNAL ROD                 | 1   |      |
| 5        | D-1731-1/M   | ASTA INTERNA MONITOR HP T3          | INNER ROD                    | 1   |      |
| 6        | 7435D52S2    | ANELLO ELASTICO PER ALBERI D.52     | SHAFT LOCKING RING D.52      | 1   |      |
| 7        | SEEGJVD68S25 | ANELLO SEEGER PER FORI D.68 TIPO JV | D.68 LOCKING RING JV TYPE    | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



4.14 D.127 K3 NOZZLES HOLDER: J-12K34000

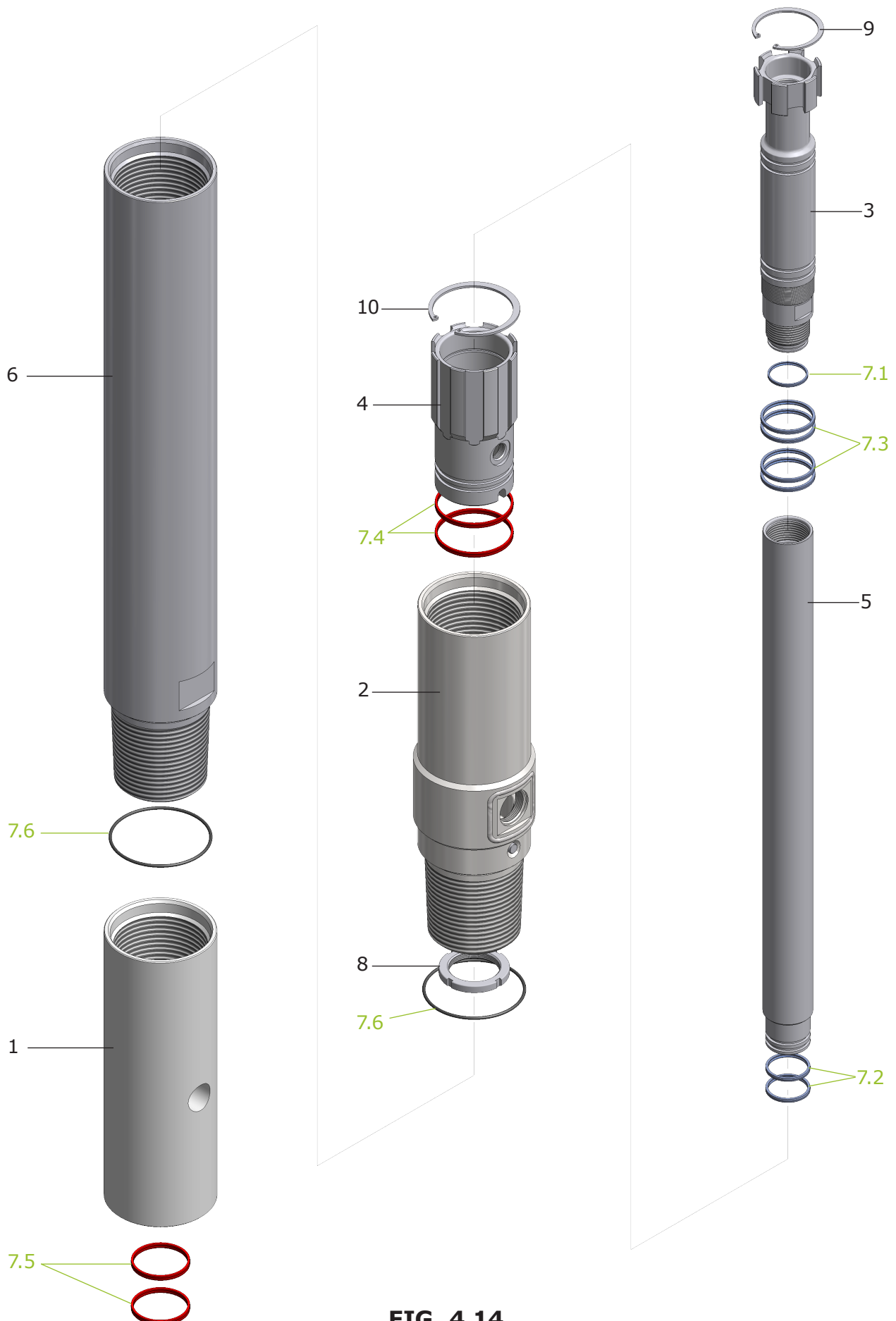
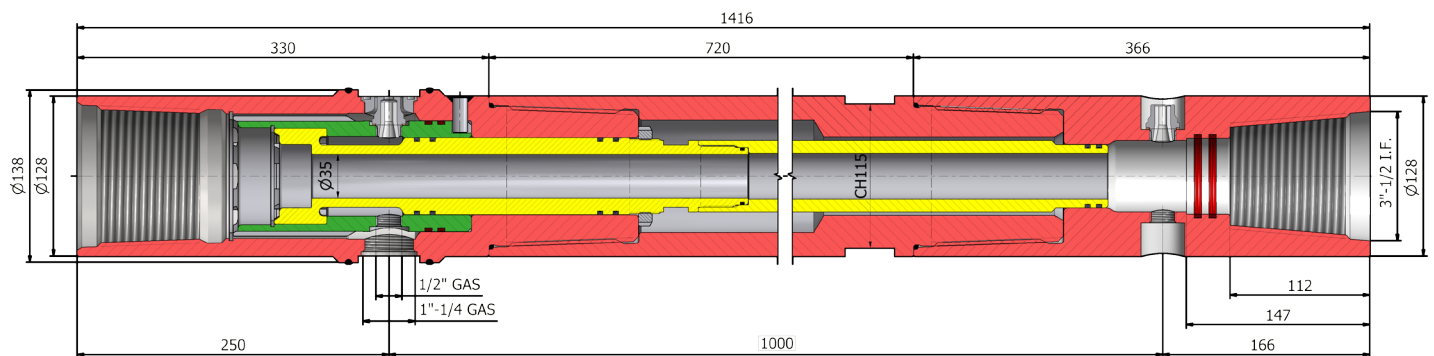


FIG. 4.14

J-12K34000: D.127 K3 NOZZLES HOLDER (REF. FIG. 4.14)

| REF. No. | CODICE CODE    | DESCRIZIONE                       | DESCRIPTION                      | QTY | NOTE |
|----------|----------------|-----------------------------------|----------------------------------|-----|------|
| 1        | D-1354-600-1   | MONITOR CEMENTO                   | GROUT NOZZLES HOLDER             | 1   |      |
| 2        | D-1354-600-2   | CORPO ESTERNO ARIA/ACQUA          | AIR/WATER EXTERNAL BODY          | 1   |      |
| 3        | D-1354-600-3   | MANIC. FEM. INTERNO ARIA/ACQUA    | INNER FEMALE AIR/WATER BODY      | 1   |      |
| 4        | D-1354-600-4   | MANIC. FEM. INTERM. ARIA/ACQUA    | MIDDLE FEMALE AIR/WATER BODY     | 1   |      |
| 5        | D-1354-600-5   | ASTA INTERNA                      | INNER ROD                        | 1   |      |
| 6        | D-1354-600-6   | ASTA COLLEGAMENTO                 | CONNECTING ROD                   | 1   |      |
| 7        | J-12K34001     | KIT GUARNIZIONI MONITOR D.127 K3  | D.127 K3 NOZ. HOLDER SEALS KIT   | 1   |      |
| 7.1      | D-1354-F       | K35-P 41.5X46 L=3.5 T-ECOPUR      | K35-P 41.5X46 L=3.5 T-ECOPUR     | 1   | (1)  |
| 7.2      | D-1439-A       | K35-P 44.8X51 L=4.5 T-ECOPUR      | K35-P 44.8X51 L=4.5 T-ECOPUR     | 2   | (1)  |
| 7.3      | D-1354-A       | K35-P 55.8X62 L=4.5 T-ECOPUR      | K35-P 55.8X62 L=4.5 T-ECOPUR     | 4   | (1)  |
| 7.4      | D-1171-A       | R15-P 82.8X89 L=5.9 H-ECOPUR TPU  | R15-P 82.8X89 L=5.9 H-ECOPUR TPU | 2   | (1)  |
| 7.5      | D-0604-12      | R15-P 60.8X67 L=5.9 H-ECOPUR TPU  | R15-P 60.8X67 L=5.9 H-ECOPUR TPU | 2   | (1)  |
| 7.6      | MR-OR244       | O-RING 244 RIF POLYPAC            | O-RING 244 REF POLYPAC           | 2   | (1)  |
| 8        | MR-DIN981-KM12 | GHIERA M60x2 AUTOBLOCCANTE        | M60x2 LOCKNUT                    | 1   |      |
| 9        | 7437D78S25     | ANELLO ELAST. FORI D.78 UNI 7437  | D.78 UNI 7437 LOCKING RING       | 1   |      |
| 10       | 7437D100S3     | ANELLO ELAST. FORI D.100 UNI 7437 | D.100 UNI 7437 LOCKING RING      | 1   |      |

(1) NON VENDIBILI SEPARATAMENTE - NOT AVAILABLE SEPARATELY



4.15 D.127 BIT ADAPTER: J-12C20752

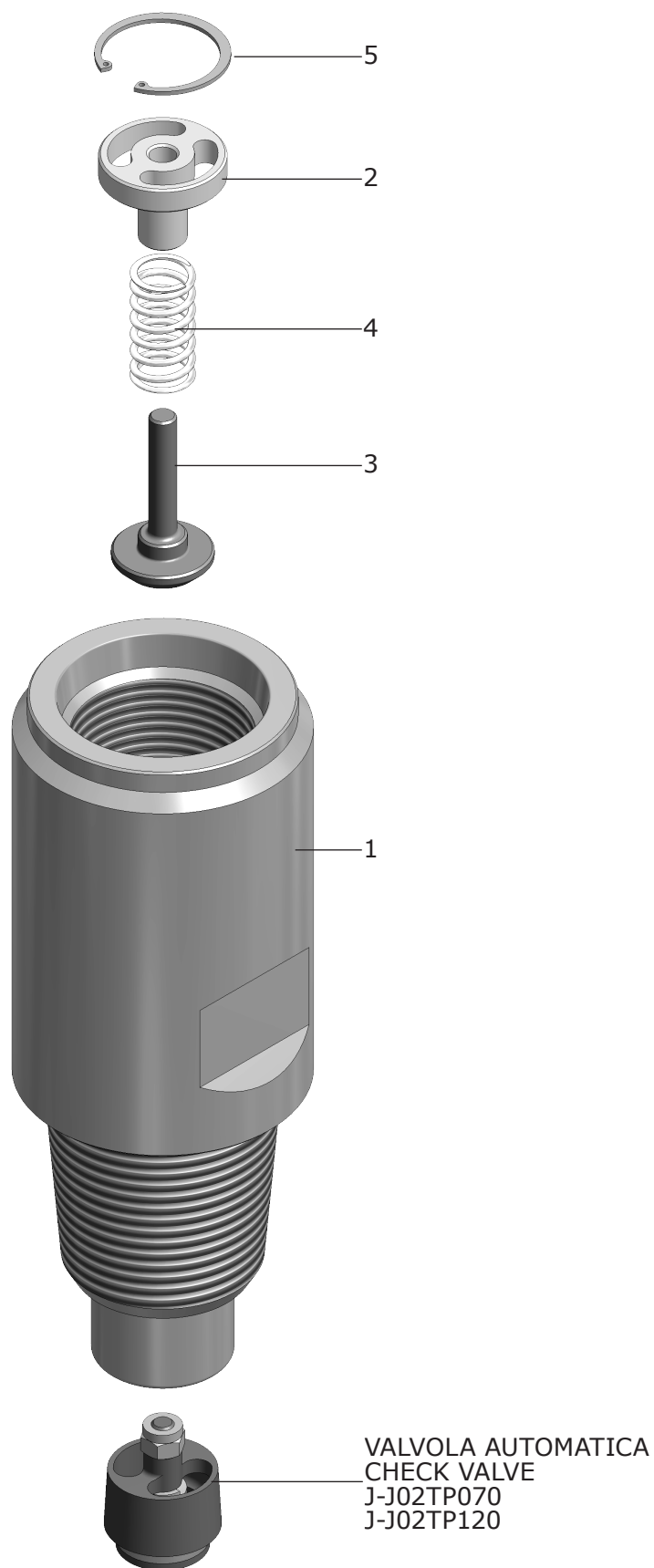


FIG. 4.15



J-12C20752: D.127 BIT ADAPTER (REF. FIG. 4.15)

| REF. No. | CODICE CODE     | DESCRIZIONE                          | DESCRIPTION                      | QTY | NOTE |
|----------|-----------------|--------------------------------------|----------------------------------|-----|------|
| 1        | D-1354-101-1    | CORPO PORTASCALP. 127 3"-1/2 A.R.    | 127 BIT ADAPTER BODY 3"-1/2 A.R. | 1   |      |
| 2        | D-1599-7-2      | SUPPORTO VALVOLA NO RIT. 127/140     | 127/140 NO-RET. VALVE HOUSING    | 1   |      |
| 3        | D-1599-7-3      | FUNGO VALVOLA NO-RIT. 127/140        | 127/140 NO-RETURN VALVE BODY     | 1   |      |
| 4        | C1100-125-2250S | MOLLA INOX Do 27.94 d. 3.18 Lo 57.15 | STAINLESS STEEL SPRING           | 1   |      |
| 5        | 7437D55S2       | ANELLO ELASTICO PER FORI D.55        | RETAINING RING D.55 HOLE         | 1   |      |

4.16 D.114 C2 NOZZLES HOLDER PLUS TYPE: J-1C212483-P

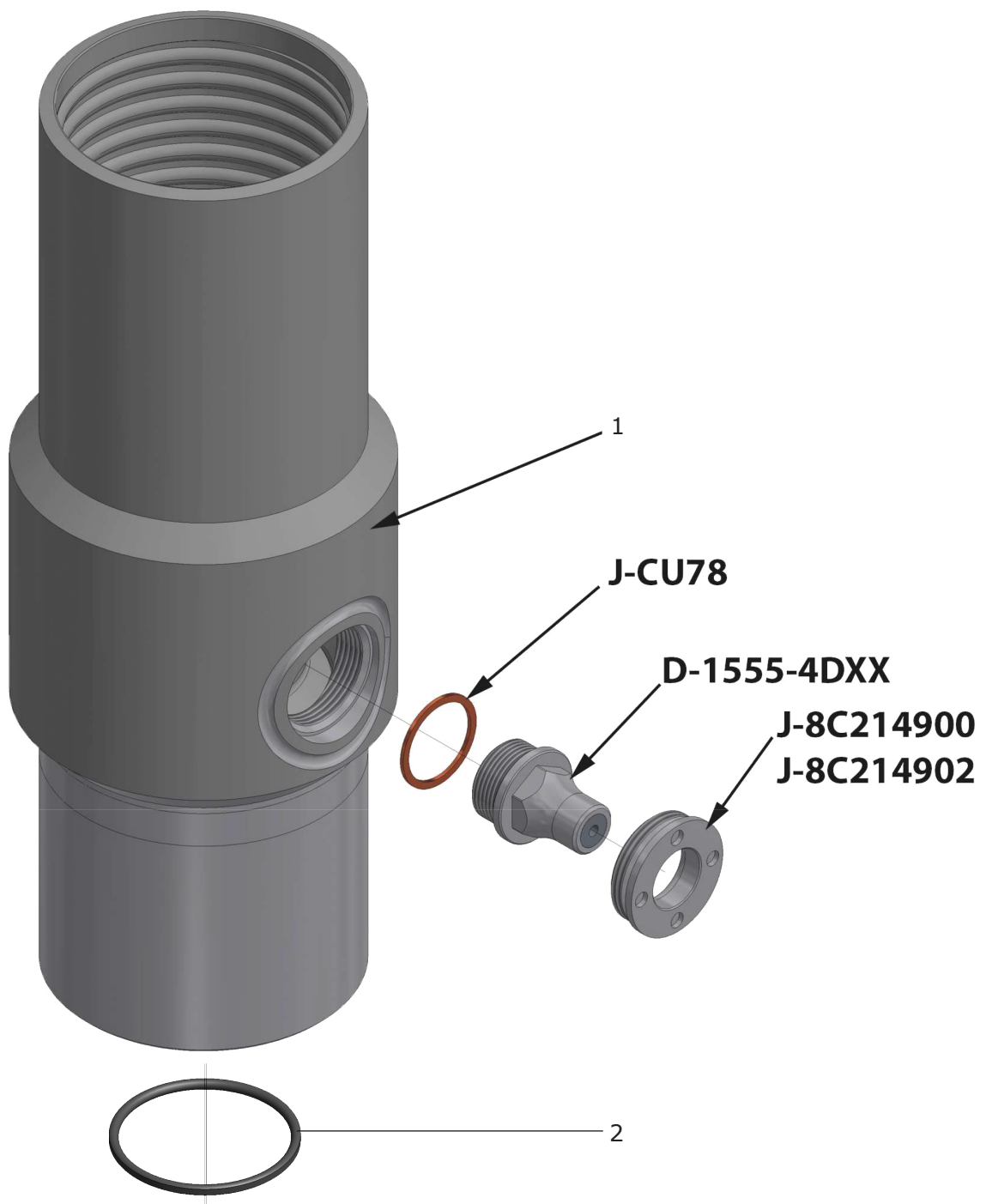
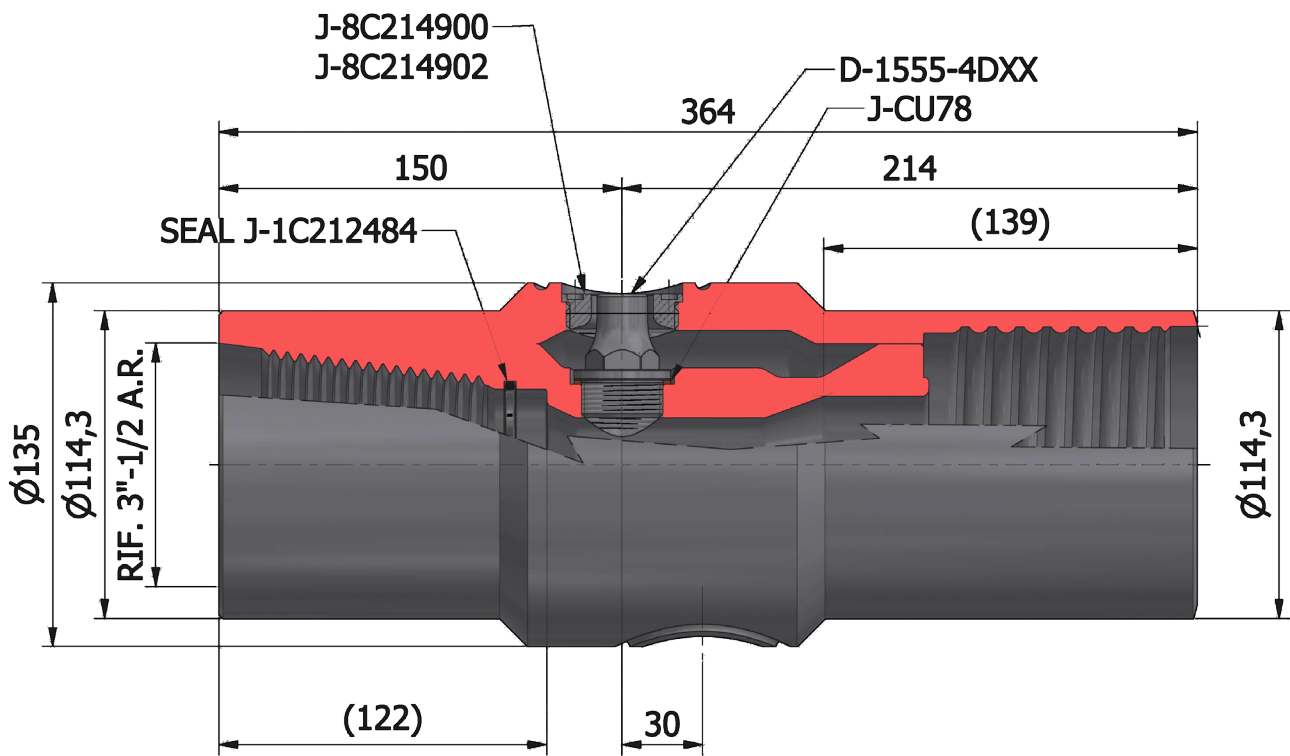


FIG. 4.16

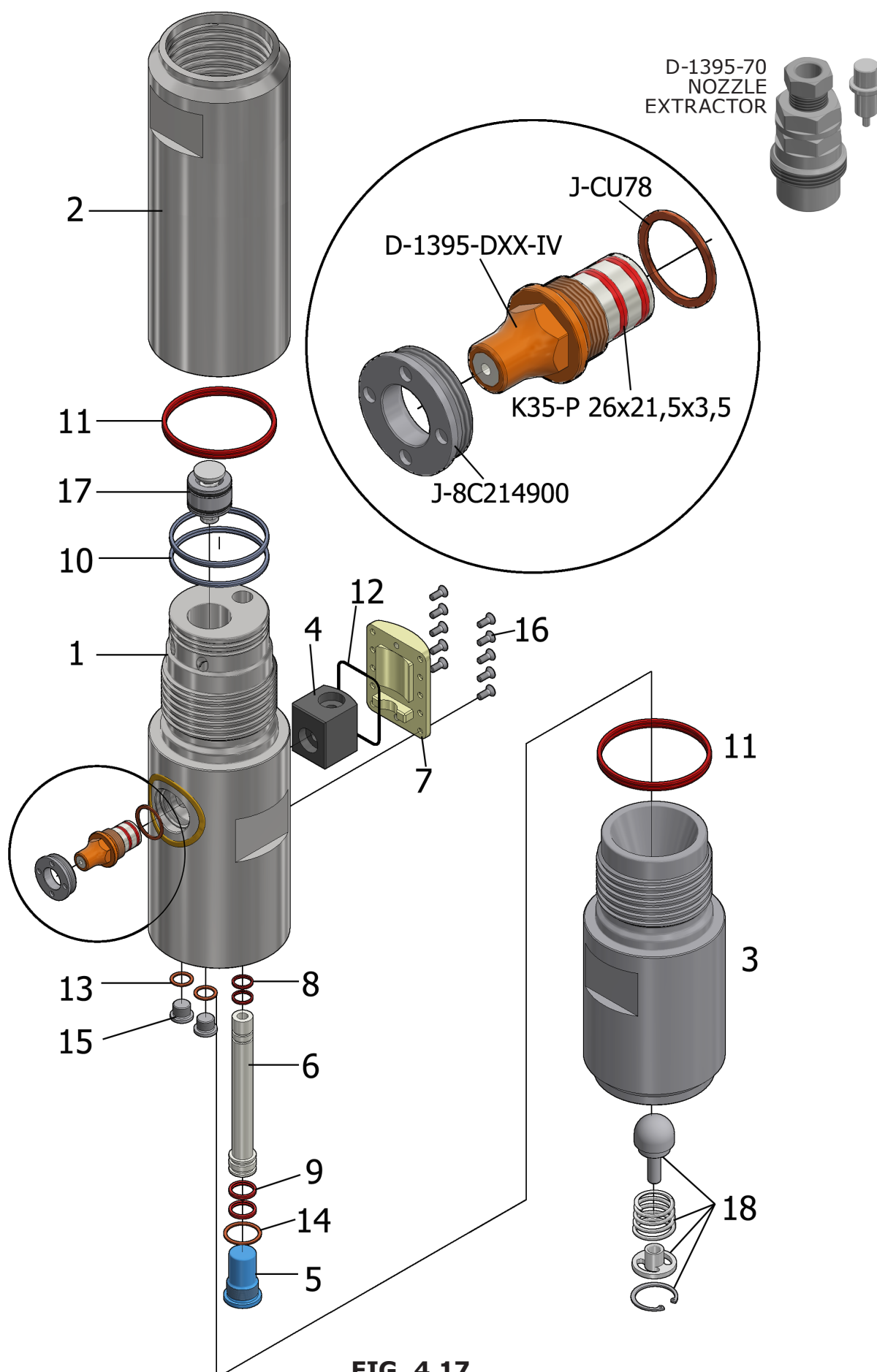
J-1C212483-P (REF. FIG. 4.16)

| REF. No. | CODICE CODE  | DESCRIZIONE                  | DESCRIPTION                 | QTY | NOTE |
|----------|--------------|------------------------------|-----------------------------|-----|------|
| 1        | J-1C212483-P | MONITOR D.114 C2 PLUS        | D.114 C2 NOZZLE HOLDER PLUS | 1   |      |
| 2        | J-1C212484   | GUARNIZIONE MONITOR D.114 C2 | D.114 C2 NOZZLE HOLDER SEAL | 1   |      |





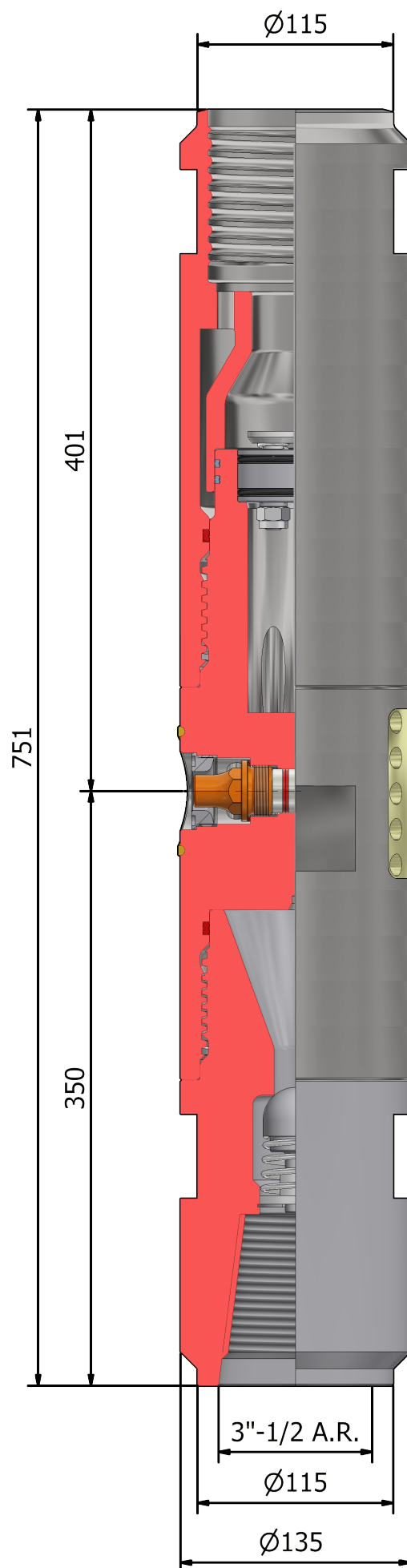
# 4.17 S.T.R.A.JET STEP IV NOZZLES HOLDER: J-1C212470-4





J-1C212470-4: STRAJET STEP IV NOZZLES HOLDER (REF. FIG. 4.17)

| REF. No. | CODICE CODE                  | DESCRIZIONE                                           | DESCRIPTION                                    | QTY | NOTE |
|----------|------------------------------|-------------------------------------------------------|------------------------------------------------|-----|------|
| 1        | 1395-1F                      | CORPO MONITOR S.T.R.A.JET STEP 4                      | S.T.R.A.JET STEP 4 NOZZLES HOLDER BODY         | 1   |      |
| 2        | 1395-2F                      | CORPO SUPERIORE MONITOR S.T.R.A.JET STEP 4            | S.T.R.A.JET STEP 4 NOZZLES HOLDER UPPER BODY   | 1   |      |
| 3        | 1395-3D                      | RACCORDO INFERIORE                                    | LOWER ADAPTER                                  | 1   |      |
| 4        | 1395-12WA                    | RACCORDO IN CARBURO DI TUNGSTENO                      | TUNGSTEN CARBIDE ELBOW DUCT BODY               | 1   |      |
| 5        | 1395-15W                     | TAPPO DI FERMO RACCORDO                               | STOP PLUG                                      | 1   |      |
| 6        | 1395-22                      | CONDOTTO IN CARBURO DI TUNGSTENO                      | TUNGSTEN CARBIDE DUCT                          | 1   |      |
| 7        | 1395-23                      | SPORTELLLO                                            | COVER                                          | 1   |      |
| 8        | K35-P 20x16.9x2.5            | GUARNIZIONE POLIURETANO H-ECOPUR                      | POLYURETHANE H-ECOPUR SEAL                     | 2   |      |
| 9        | K35-P 26x21.5x3.5            | GUARNIZIONE POLIURETANO H-ECOPUR                      | POLYURETHANE H-ECOPUR SEAL                     | 4   |      |
| 10       | K35-P 88.8x95x4.5 (D-1439-B) | GUARNIZIONE POLIURETANO T-ECOPUR                      | POLYURETHANE T-ECOPUR SEAL                     | 2   |      |
| 11       | R15-P 101x109x7.7            | GUARNIZIONE POLIURETANO H-ECOPUR                      | POLYURETHANE H-ECOPUR SEAL                     | 2   |      |
| 12       | CORDA O-RING s=1.78 L=249    | GUARNIZIONE SPORTELLLO                                | COVER SEAL                                     | 1   |      |
| 13       | J-CU38                       | GUARNIZIONE RAME 3/8" GAS                             | 3/8" COPPER SEAL                               | 2   |      |
| 14       | J-CU78                       | GUARNIZIONE RAME 7/8" GAS                             | 7/8" COPPER SEAL                               | 2   |      |
| 15       | DIN 908 - G 0,375 A          | TAPPO HEX INCASSATO 3/8" GAS                          | 3/8" PLUG                                      | 2   |      |
| 16       | UNI 5933 - M6 x 16           | VITE TPSEI CL. 10.9 ZINC.                             | COUNTERSUNK SCREW CL. 10.9                     | 10  |      |
| 17       | J-J01TPC70                   | VALVOLA AUTOMATICA TIPO CILINDRICO 70 BAR (D.114 JET) | CYLINDRICAL AUTOMATIC VALVE 70 BAR (D.114 JET) | 1   |      |
| 18       | J-JOVNR112                   | VALVOLA NON RITORNO COMPLETA                          | COMPLETE NO RETURN VALVE                       | 1   |      |



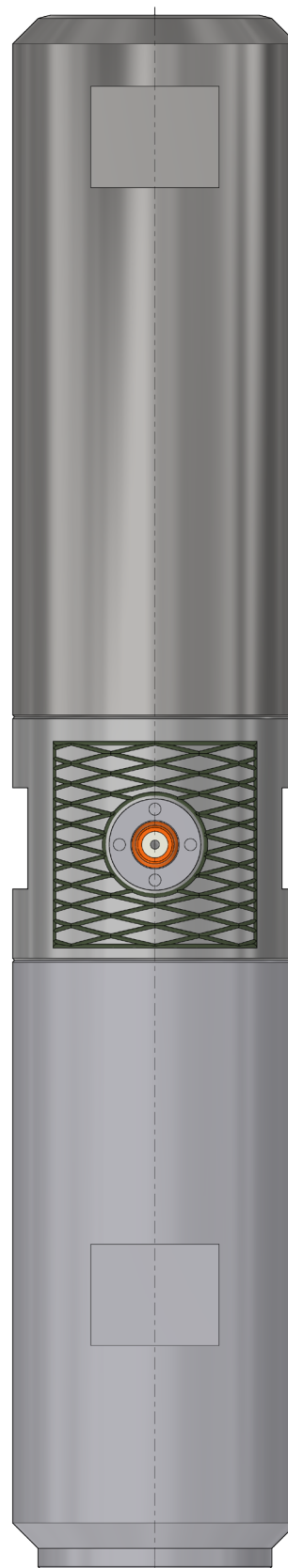
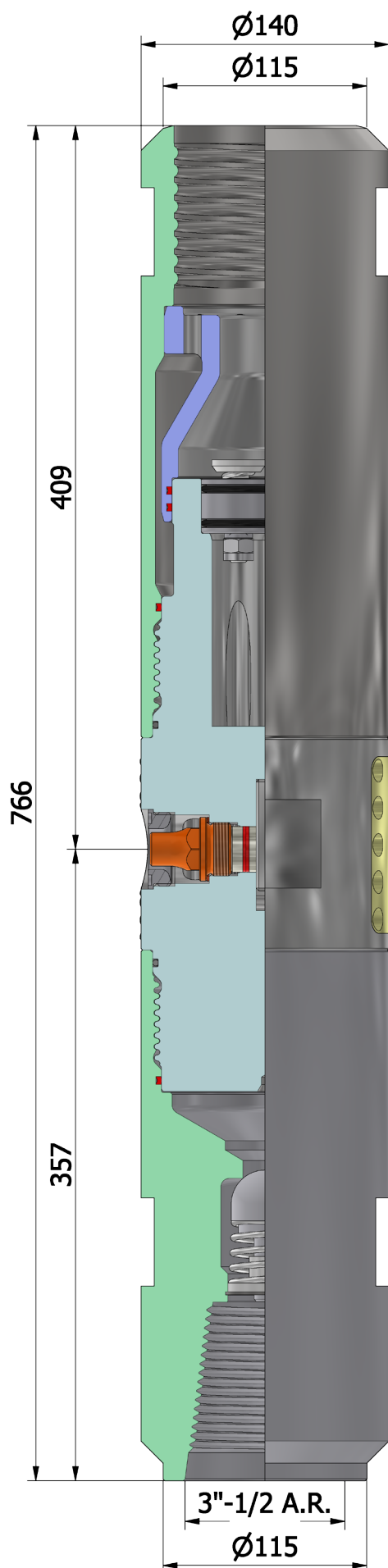
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FIG. 4.18

**FIG. 4.18**

## J-1C212470-XL: STRAJET XL NOZZLE HOLDER (REF. FIG. 4.18)

| REF. No. | CODICE CODE         | DESCRIZIONE                                               | DESCRIPTION                                    | QTY | NOTE |
|----------|---------------------|-----------------------------------------------------------|------------------------------------------------|-----|------|
| 1        | 1395-100-1          | CORPO MONITOR                                             | NOZZLE HOLDER BODY                             | 1   |      |
| 2        | 1395-100-2          | CORPO SUPERIORE                                           | NOZZLE HOLDER UPPER BODY                       | 1   |      |
| 3        | 1395-100-3          | RACCORDO INFERIORE                                        | LOWER ADAPTER                                  | 1   |      |
| 4        | 1395-100-4          | BICCHIERE INTERNO                                         | INNER ADAPTER                                  | 1   |      |
| 5        | 1395-100-5          | SPORTELLO STRAJET XL                                      | STRAJET XL PORT                                | 1   |      |
| 6        | 1395-100-12         | RACCORDO ID.15 (620U0208)                                 | ID.15 DUCT (620U0208)                          | 1   |      |
| 7        | 1354-100-15         | TAPPO DI FERMO RACCORDO ID.15                             | ID.15 STOP PLUG                                | 1   |      |
| 8        | 1395-100-22         | CONDOTTO INTERNO ID.15 (620U0209)                         | ID.15 INNER DUCT (620U0209)                    | 1   |      |
| 9        | 1395-100-23         | MEZZELUNE PER CONDOTTO INTERNO ID.15                      | ID.15 INNER DUCT HALF RINGS                    | 1   |      |
| 10       | K35-P 26x21.5x3.5   | GUARNIZIONE POLIURETANO 95 SHORE A                        | POLYURETHANE 95 SHORE A SEAL                   | 4   |      |
| 11       | S35-P 105x111,2x4.5 | GUARNIZIONE POLIURETANO 95 SHORE A                        | POLYURETHANE 95 SHORE A SEAL                   | 2   |      |
| 12       | S35-P 117x123,2x4.5 | GUARNIZIONE POLIURETANO 95 SHORE A                        | POLYURETHANE 95 SHORE A SEAL                   | 2   |      |
| 13       | OR 248              | O-RING                                                    | O-RING SEAL                                    | 2   |      |
| 14       | 1395-100-24         | GUARNIZIONE SPORTELLO [CORDA O-RING s=1.78 L=245 (OR040)] | PORT SEAL                                      | 1   |      |
| 15       | J-CU38              | GUARNIZIONE RAME 3/8"                                     | 3/8" COPPER SEAL                               | 2   |      |
| 16       | J-CU100             | GUARNIZIONE RAME 1"                                       | 1" COPPER SEAL                                 | 1   |      |
| 17       | DIN 908 - G 0,375 A | TAPPO HEX INCASSATO 3/8" BSPP                             | 3/8" BSPP PLUG                                 | 2   |      |
| 18       | UNI 5933 - M6 x 16  | VITE TPSEI                                                | COUNTERSUNK SCREW                              | 10  |      |
| 19       | J-J01TPC70          | VALVOLA AUTOMATICA TIPO CILINDRICO 70 BAR (D.114 JET)     | CYLINDRICAL AUTOMATIC VALVE 70 BAR (D.114 JET) | 1   |      |
| 20       | J-JOVNR112          | VALVOLA NON RITORNO COMPLETA                              | COMPLETE NO RETURN VALVE                       | 1   |      |
| 21       | UNI 5923 - M5 x 14  | GRANO                                                     | SCREW                                          | 2   |      |
| -        | D-1395-45           | PERNO ALLINEAMENTO RACCORDO                               | CARBIDE DUCT ALIGNEMENT PLUG                   | -   |      |
| -        | D-1395-46-XL        | ATTREZZO ESTRAZ. INSERTO CARBURO                          | INNER DUCT EXTRACTOR                           | -   |      |
| -        | D-1395-47-XL        | ATTREZZO DI SPINTA INSERTO CARBURO                        | CARBIDE DUCT PUSHING TOOL                      | -   |      |
| -        | D-1395-70           | ESTRATTORE PER UGELLO                                     | GROUT NOZZLE EXTRACTOR                         | -   |      |



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#### 4.19 S.T.R.A.JET BF NOZZLE HOLDER: J-1C212472-IV

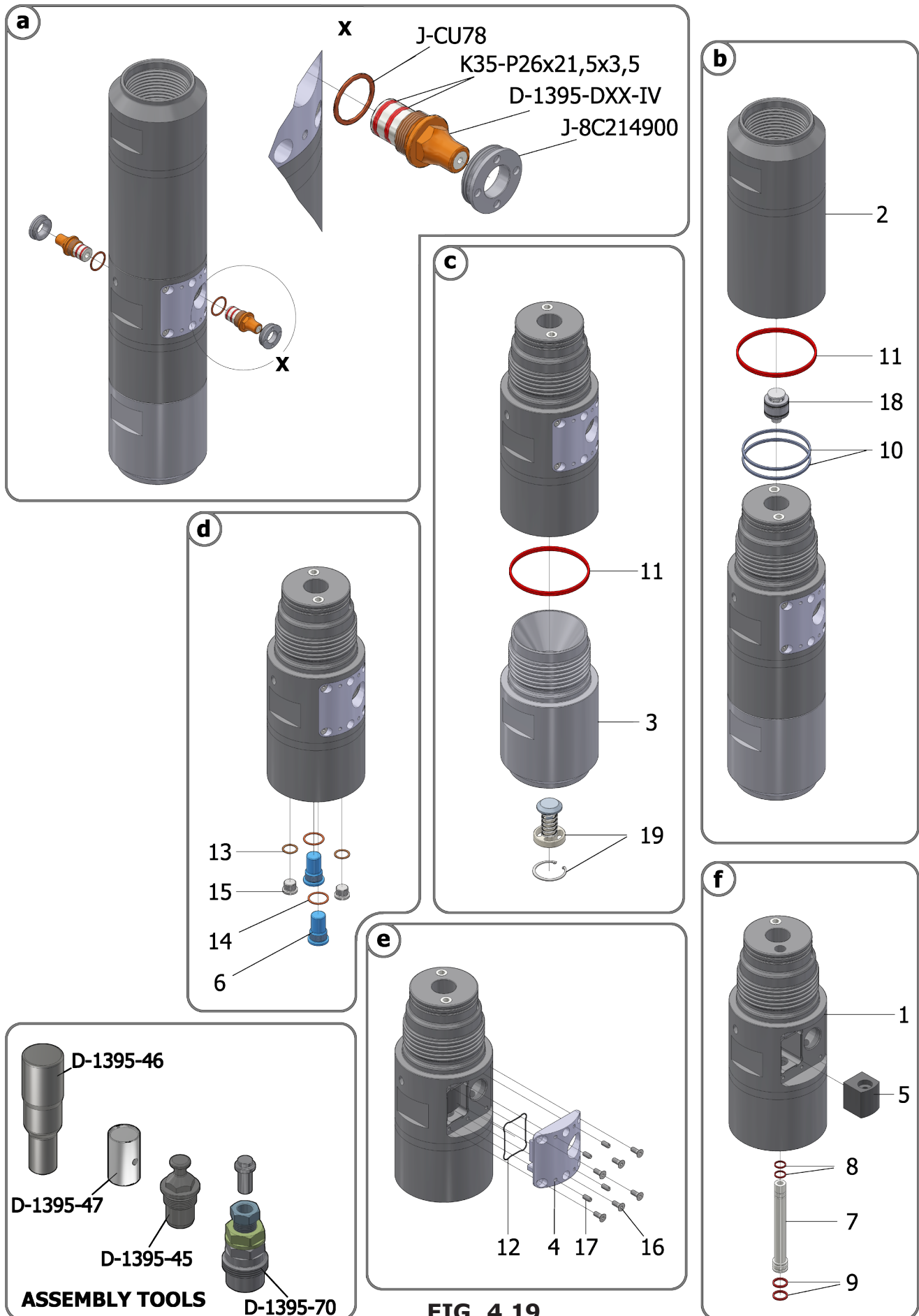
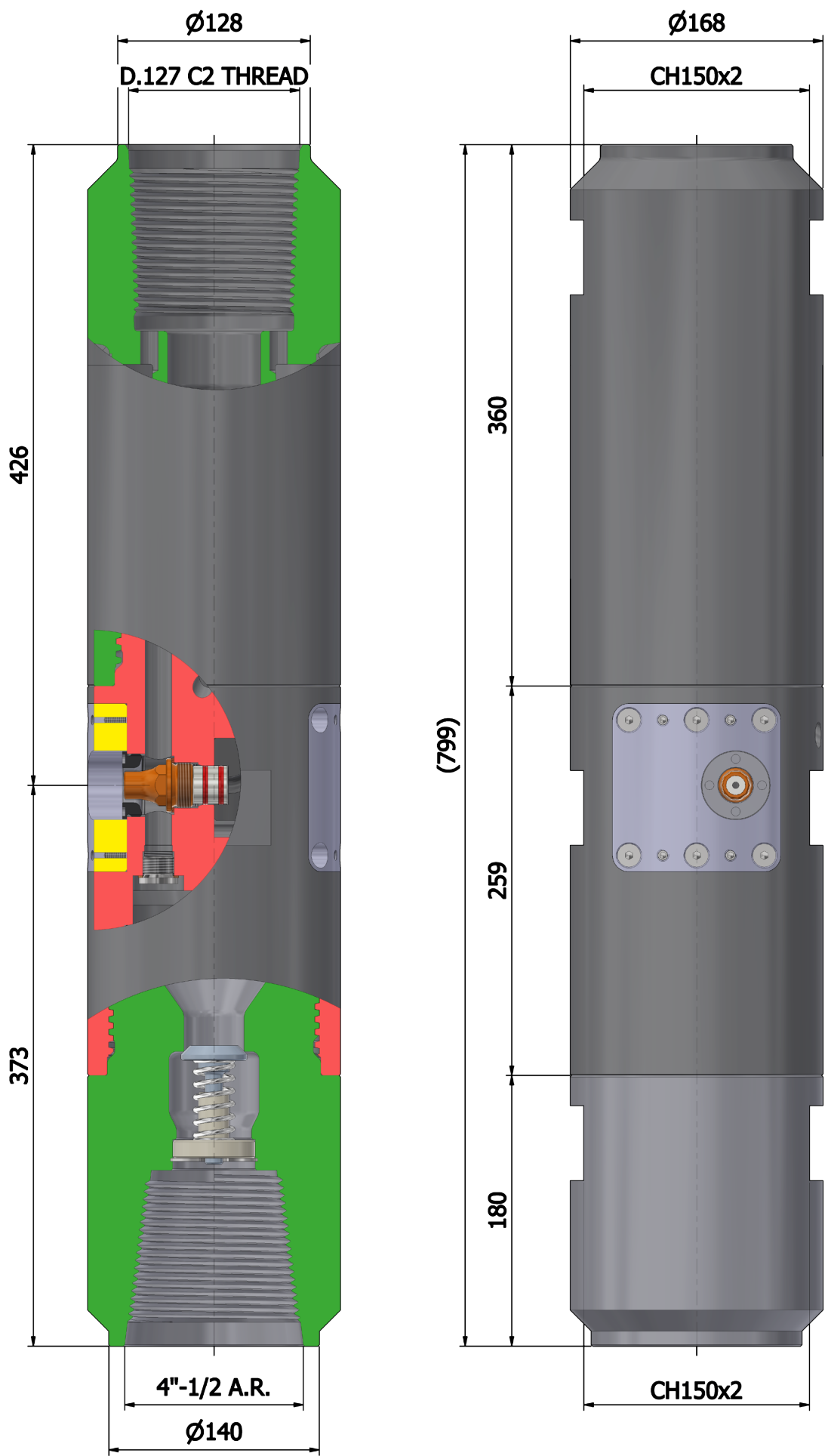


FIG. 4.19

J-1C212472-IV: STRAJET NOZZLE HOLDER (DOUBLE NOZZLE) (REF. FIG. 4.19)

| REF. No. | CODICE CODE                       | DESCRIZIONE                           | DESCRIPTION                        | QTY | NOTE |
|----------|-----------------------------------|---------------------------------------|------------------------------------|-----|------|
| 1        | D-1395BF-1                        | CORPO MONITOR BIFLUIDO                | STRAJET DOUBLE NOZZLE BODY         | 1   |      |
| 2        | D-1395BF-2                        | CORPO SUPERIORE                       | UPPER BODY                         | 1   |      |
| 3        | D-1395BF-3                        | RACCORDO INFERIORE                    | LOWER ADAPTER                      | 1   |      |
| 4        | D-1395BF-4                        | SPORTELLLO MONITOR STRAJET BIFLUIDO   | STRAJET DOUBLE NOZZLE PORT         | 2   |      |
| 5        | D-1395-12WA                       | RACC. MONOLITICO CARB. TUNGSTENO      | TUNGSTEN CARBIDE DUCT              | 2   |      |
| 6        | D-1395-15W                        | TAPPO DI FERMO RACCORDO               | STOP PLUG                          | 2   |      |
| 7        | D-1395-22-DZ                      | CONDOTTO INTERNO STRAJET DZ           | DZ STRAJET INNER DUCT              | 2   |      |
| 8        | K35-P 16.9x20L2.5                 | GUARNIZIONE POLIURETANO 95 SHORE A    | 95 SHORE A POLYURETHANE SEAL       | 4   |      |
| 9        | K35-P 21.5x26L3.5                 | GUARNIZIONE POLIURETANO 95 SHORE A    | 95 SHORE A POLYURETHANE SEAL       | 8   |      |
| 10       | K35-P 111,8x118L4.5 (D-1731-20-A) | GUARNIZIONE POLIURETANO 95 SHORE A    | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 11       | R15-P 130x138L7.7                 | GUARNIZIONE POLIURETANO 95 SHORE A    | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 12       | OR 041 (D-1395BF-4-OR)            | O-RING PER SPORTELLLO                 | O-RING PORT SEAL                   | 2   |      |
| 13       | J-CU12                            | GUARNIZIONE RAME 1/2"                 | 1/2" COPPER SEAL                   | 2   |      |
| 14       | J-CU78                            | GUARN. RAME De=36 Di=30.5 SP. 1.5     | 7/8" COPPER SEAL                   | 4   |      |
| 15       | J-J33TB012                        | TAPPO M. 1/2" GAS EX INC              | 1/2" BSPP PLUG                     | 2   |      |
| 16       | 5933M8x20P125ZB                   | VITE TPSEI UNI 5933 - M8 x 20         | COUNTERSUNK SCREW UNI 5933 M8x20   | 12  |      |
| 17       | 5923M8x16P125H45GR                | VSTCE PP 8x16 P=1.25 UNI 5923 H45 GR  | UNI 5923 M8x16 SCREW               | 8   |      |
| 18       | J-J0NTPC70                        | VALVOLA AUTOM. TIPO CILINDRICO 70 BAR | CYLINDRICAL AUTOMATIC VALVE 70 BAR | 1   |      |
| 19       | J-JOVNR140                        | VALVOLA NON RITORNO 127/140 C2        | 127/140 C2 NO-RETURN VALVE         | 1   |      |
| -        | D-1395-45                         | PERNO ALLINEAMENTO RACCORDO           | CARBIDE DUCT ALIGNEMENT PLUG       | -   |      |
| -        | D-1395-46                         | ATTREZZO ESTRAZ. INSERTO CARBURO      | INNER DUCT EXTRACTOR               | -   |      |
| -        | D-1395-47                         | ATTREZZO DI SPINTA INSERTO CARBURO    | CARBIDE DUCT PUSHING TOOL          | -   |      |
| -        | D-1395-70                         | ESTRATTORE PER UGELLO                 | GROUT NOZZLE EXTRACTOR             | -   |      |



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4.20 C2H HEX 80 (2x150° + 2x90°) NOZZLES HOLDER: J-EC2H4000

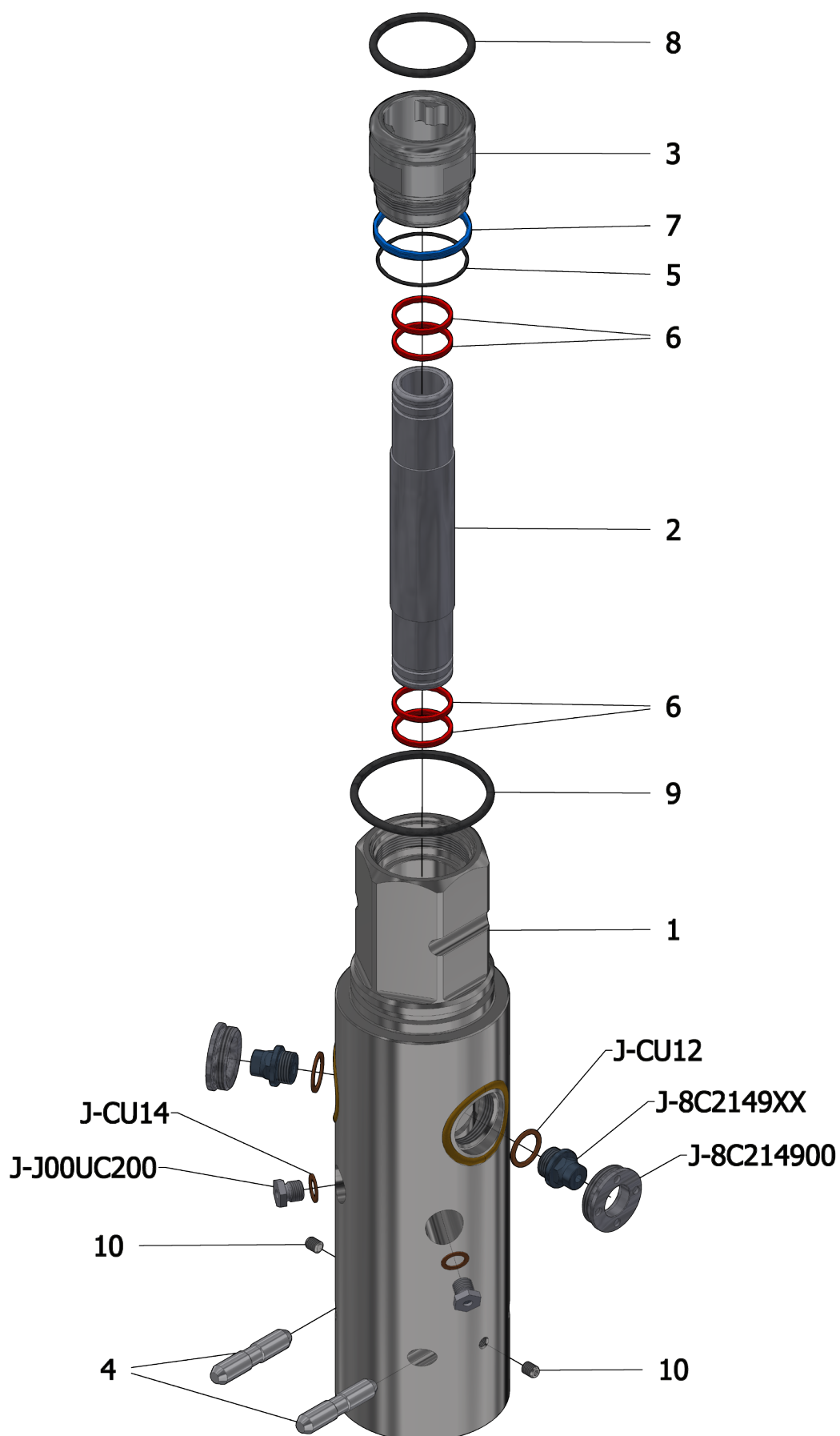
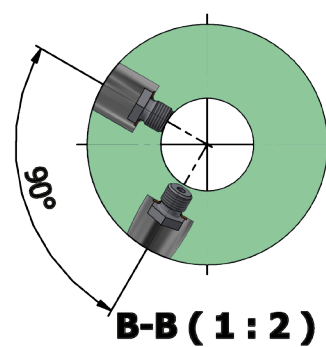
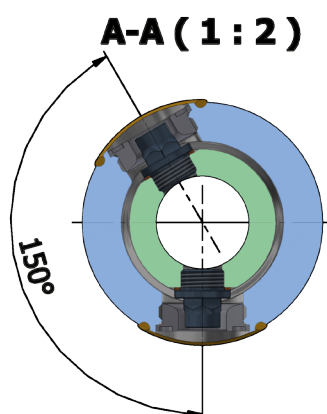
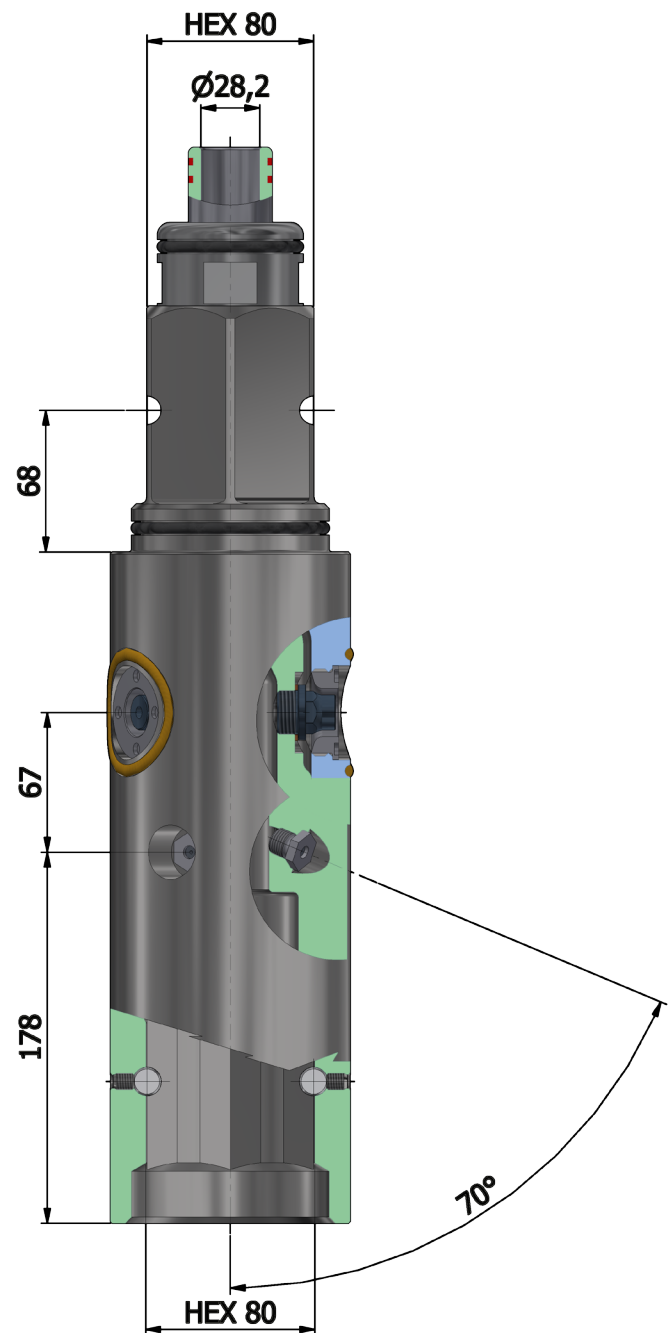
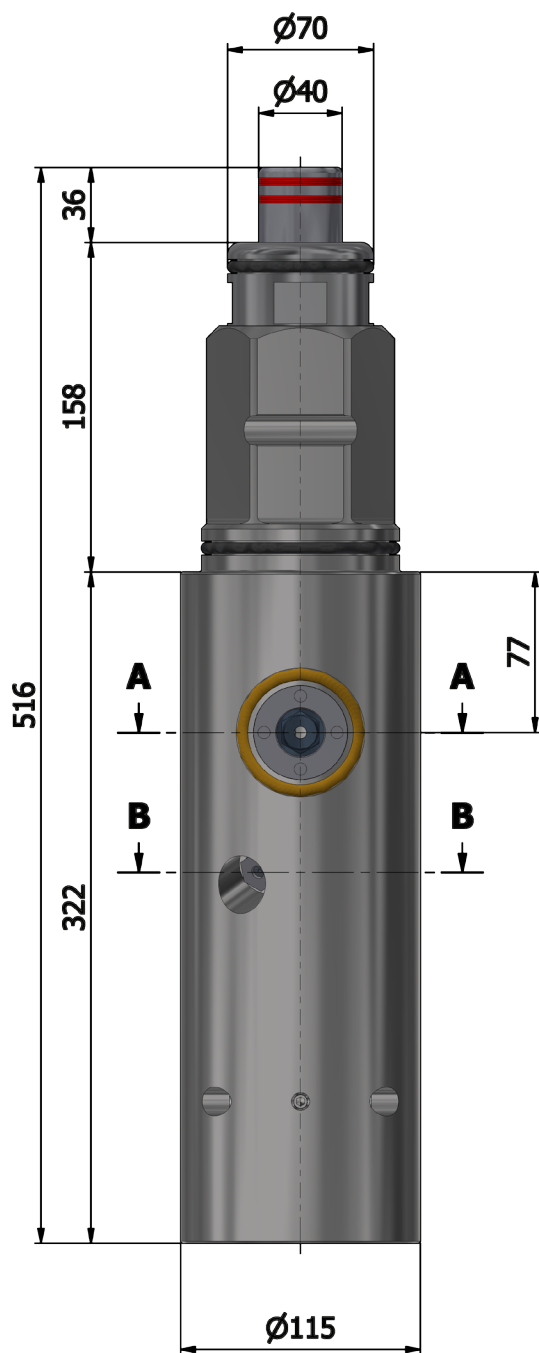


FIG. 4.20

| J-EC2H4000: C2H HEX 80 (2x150° + 2x90°) NOZZLES HOLDER (REF. FIG. 4.20) |                    |                                         |                                        |     |      |
|-------------------------------------------------------------------------|--------------------|-----------------------------------------|----------------------------------------|-----|------|
| REF. No.                                                                | CODICE CODE        | DESCRIZIONE                             | DESCRIPTION                            | QTY | NOTE |
| 1                                                                       | D-1531-11S2        | CORPO MONITOR C2H HEX80                 | C2H HEX80 NOZZLES HOLDER BODY          | 1   |      |
| 2                                                                       | D-1531-11-3        | TUBO INTERNO MONITOR C2H HEX80          | C2H HEX80 N. H. INNER PIPE             | 1   |      |
| 3                                                                       | D-1531-1-3         | MANICOTTINO ANTERIORE                   | FRONT JOINT                            | 1   |      |
| 4                                                                       | D-1383-1-4         | PERNO BLOCCO ASTE                       | LOCKING PIN                            | 2   |      |
| 5                                                                       | MR-OR035FPM90      | O-RING                                  | O-RING SEAL                            | 1   |      |
| 6                                                                       | OP 126             | GUARNIZ. POLIURET. 93 SH.-A 40x35,5x3,5 | POLIURETHANE SEAL 93 SH.-A 40x35,5x3,5 | 4   |      |
| 7                                                                       | OP 142-A           | GUARNIZ. POLIURETANO 93 SH.-A 65x60,5x5 | POLIURETHANE SEAL 93 SH.-A 65x60,5x5   | 1   |      |
| 8                                                                       | MR-OR332           | O-RING                                  | O-RING SEAL                            | 1   |      |
| 9                                                                       | MR-OR340           | O-RING                                  | O-RING SEAL                            | 1   |      |
| 10                                                                      | 5923M8X10P125H45GR | GRANO PUNTA PIANA                       | SET SCREW FLAT TIP                     | 2   |      |



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#### 4.21 C2H HEX 80 BIT ADAPTER: J-EC2H5000

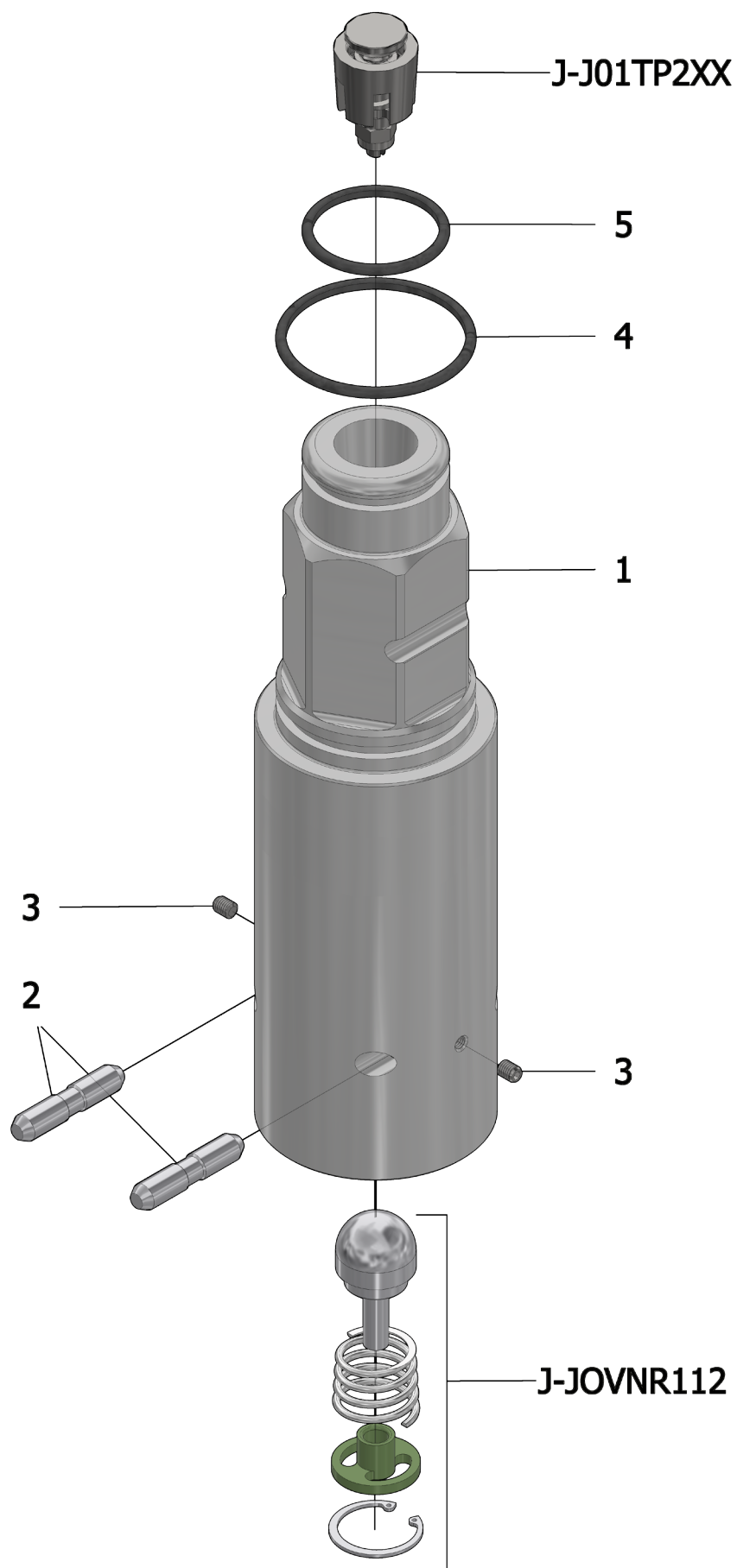
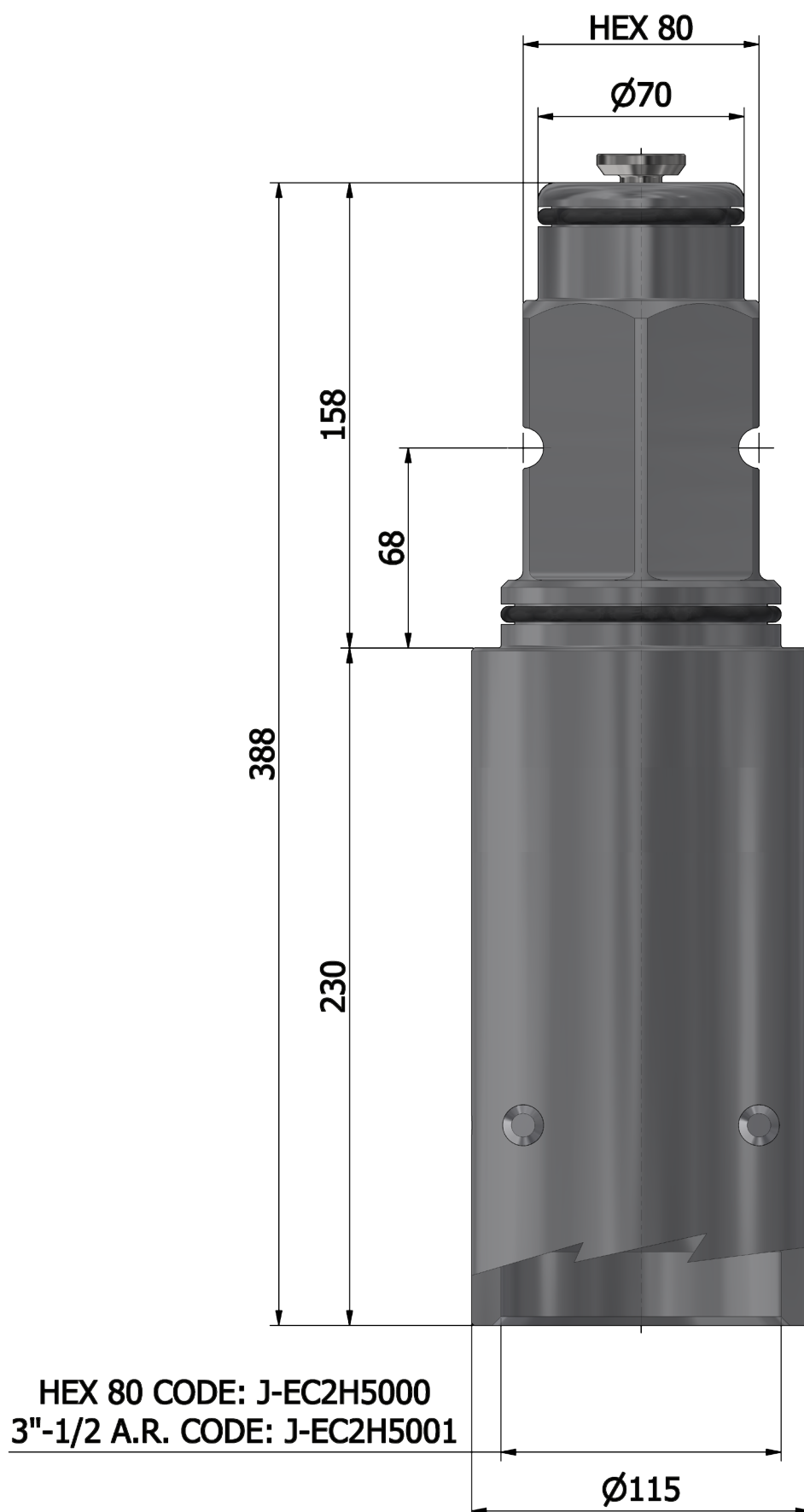


FIG. 4.21

J-EC2H5000 (J-EC2H5001): C2H HEX 80 BIT ADAPTER (REF. FIG. 4.21)

| REF. No. | CODICE CODE        | DESCRIZIONE                                 | DESCRIPTION                                | QTY | NOTE |
|----------|--------------------|---------------------------------------------|--------------------------------------------|-----|------|
| 1        | D-1531-13          | CORPO PORTASCALPELLO C2H HEX80              | C2H HEX80 BIT ADAPTER BODY                 | 1   |      |
| 1        | D-1531-12          | CORPO PORTASCALP. C2H HEX80 M/F 3"-1/2 A.R. | BIT ADAPTER BODY C2H HEX80 M/F 3"-1/2 A.R. | 1   |      |
| 2        | D-1383-1-4         | PERNO BLOCCO ASTE                           | LOCKING PIN                                | 2   |      |
| 3        | 5923M8X10P125H45GR | GRANO PUNTA PIANA                           | SET SCREW FLAT TIP                         | 2   |      |
| 4        | MR-OR340           | O-RING                                      | O-RING SEAL                                | 1   |      |
| 5        | MR-OR332           | O-RING                                      | O-RING SEAL                                | 1   |      |



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## 4.22 S.T.R.A.JET XL NOZZLE HOLDER (DOUBLE NOZZLE)

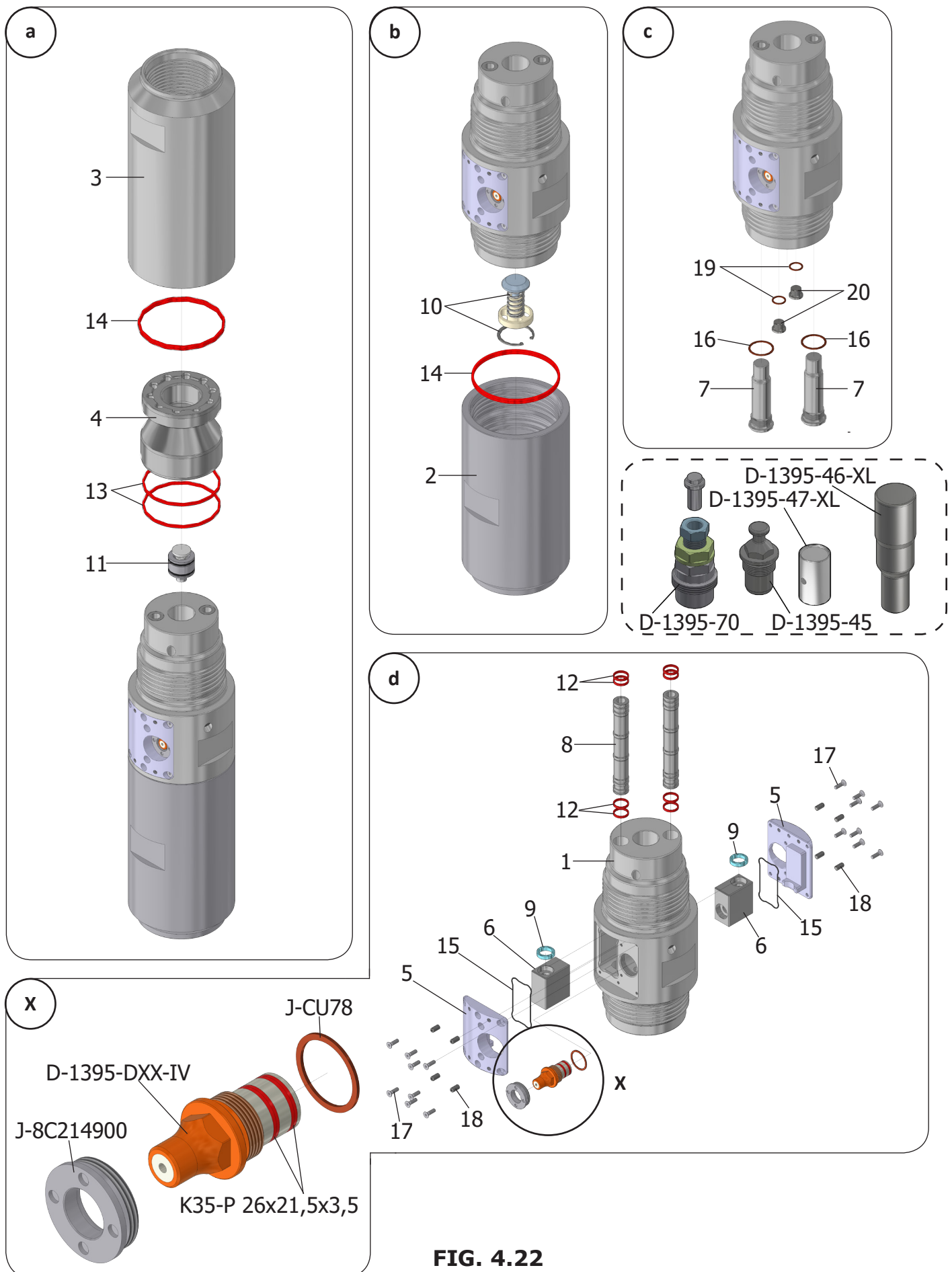
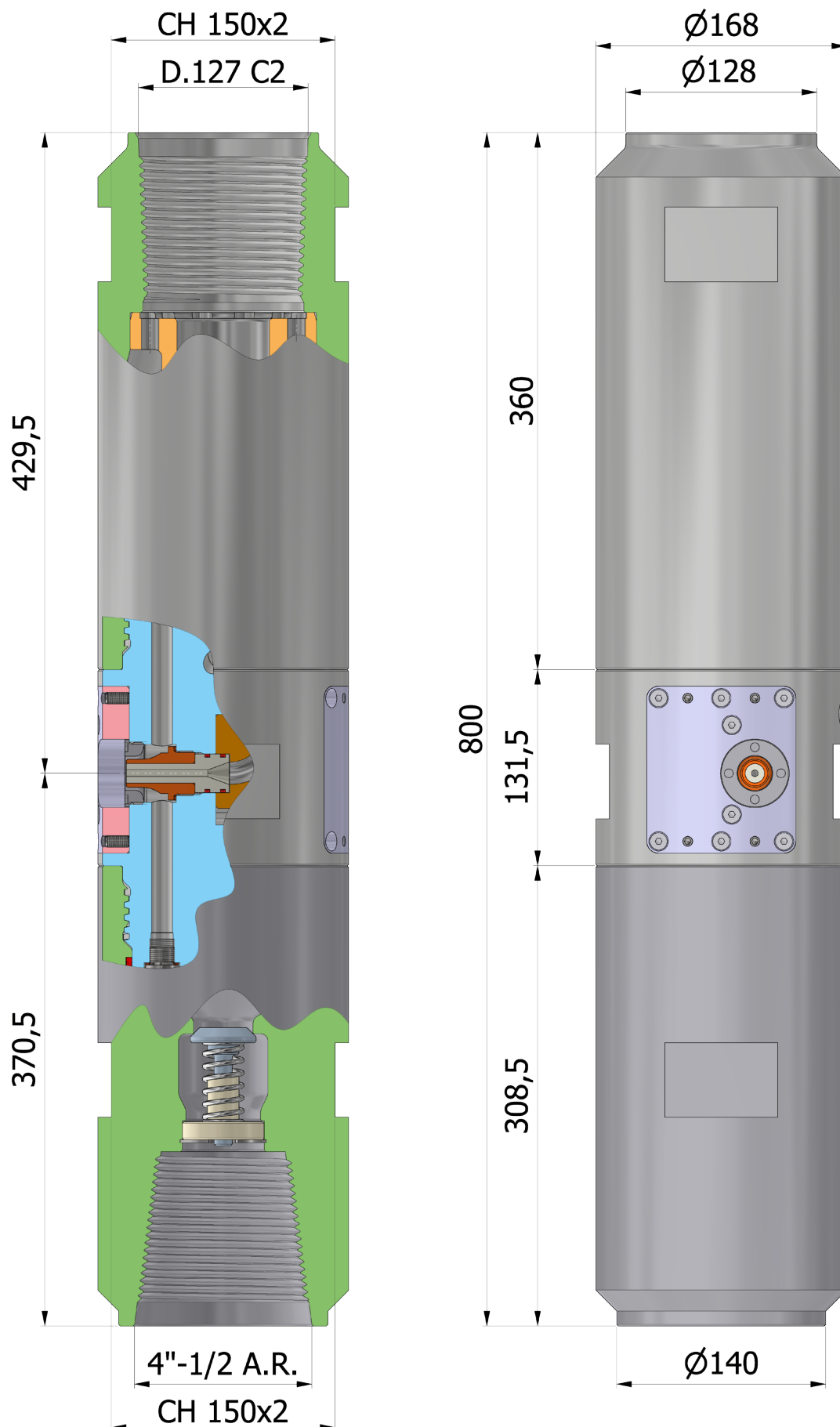


FIG. 4.22

J-1C212472-XL: STRAJET NOZZLE HOLDER XL (DOUBLE NOZZLE) (REF. FIG. 4.22)

| REF. No. | CODICE CODE        | DESCRIZIONE                        | DESCRIPTION                        | QTY | NOTE |
|----------|--------------------|------------------------------------|------------------------------------|-----|------|
| 1        | D-1395DXL-1        | CORPO MONITOR DOPPIO UGELLO XL     | NOZZLE HOLDER XL BODY              | 1   |      |
| 2        | D-1395DXL-2        | CORPO SUP. MONITOR DOPPIO UG. XL   | NOZZLE HOLDER XL UPPER BODY        | 1   |      |
| 3        | D-1395DXL-3        | RACC. INF. MONITOR DOPPIO UG. XL   | NOZZLE H. XL LOWER ADAPTER         | 1   |      |
| 4        | D-1395DXL-4        | BICCHIERE INTERNO XL               | INNER COUPLING XL                  | 1   |      |
| 5        | D-1395DXL-5        | SPORTELLLO MONITOR DOPPIO UG. XL   | DOUBLE NOZZLE XL PORT              | 2   |      |
| 6        | D-1395-100-12      | RACCORDO ID.15 STRAJET             | ID.15 TUNGSTEN CARBIDE DUCT        | 2   |      |
| 7        | D-1395-100-15      | TAPPO DI FERMO RACCORDO ID.15      | ID.15 STOP PLUG                    | 2   |      |
| 8        | D-1395-100-22      | CONDOTTO INTERNO ID.15 STRAJET     | STRAJET ID.15 INNER DUCT           | 2   |      |
| 9        | D-1395-100-23      | MEZZELUNE FERMO COND. INT. ID.15   | HALF RINGS ID.15 INNER DUCT        | 2   |      |
| 10       | J-JOVNR140         | VALVOLA NON RITORNO 127/140 C2     | 127/140 C2 NO-RETURN VALVE         | 1   |      |
| 11       | J-J0NTPC70         | VALVOLA AUTOM. TIPO CIL. 70 BAR    | CYLINDRICAL AUTOMATIC VALVE 70 BAR | 1   |      |
| 12       | K35-P21.50X26L3.5  | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 8   |      |
| 13       | S35-P117X123.2X4.5 | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 14       | R15-P130X138L7.7   | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 15       | MR-OR041           | O-RING                             | O-RING                             | 2   |      |
| 16       | J-CU100            | GUARNIZIONE RAME 1"                | 1" COPPER SEAL                     | 2   |      |
| 17       | 5933M6X20P1109ZB   | VITE TPSEI M6X20 UNI 5933 10.9 ZB  | M6x20 UNI5933 COUNTERSUNK SCREW    | 16  |      |
| 18       | 5923M8X16P125H45GR | VSTCE PIANA M8X16 UNI5923 H45GR    | M8x16 UNI5923 FLAT SET SCREW       | 8   |      |
| 19       | J-CU38             | GUARNIZIONE RAME 3/8"              | 3/8" COPPER SEAL                   | 2   |      |
| 20       | J-J13TP038         | TAPPO M. 3/8 ESAGONO INCASSATO     | 3/8" MALE PLUG                     | 2   |      |
| -        | D-1395-45          | PERNO ALLINEAMENTO RACCORDO        | CARBIDE DUCT ALIGNEMENT PLUG       | -   | (*)  |
| -        | D-1395-46-XL       | ATTREZZO ESTRAZ. INSERTO CARBURO   | INNER DUCT EXTRACTOR               | -   | (*)  |
| -        | D-1395-47-XL       | ATTREZZO DI SPINTA INSERTO CARBURO | CARBIDE DUCT PUSHING TOOL          | -   | (*)  |
| -        | D-1395-70          | ESTRATTORE PER UGELLO              | GROUT NOZZLE EXTRACTOR             | -   | (*)  |

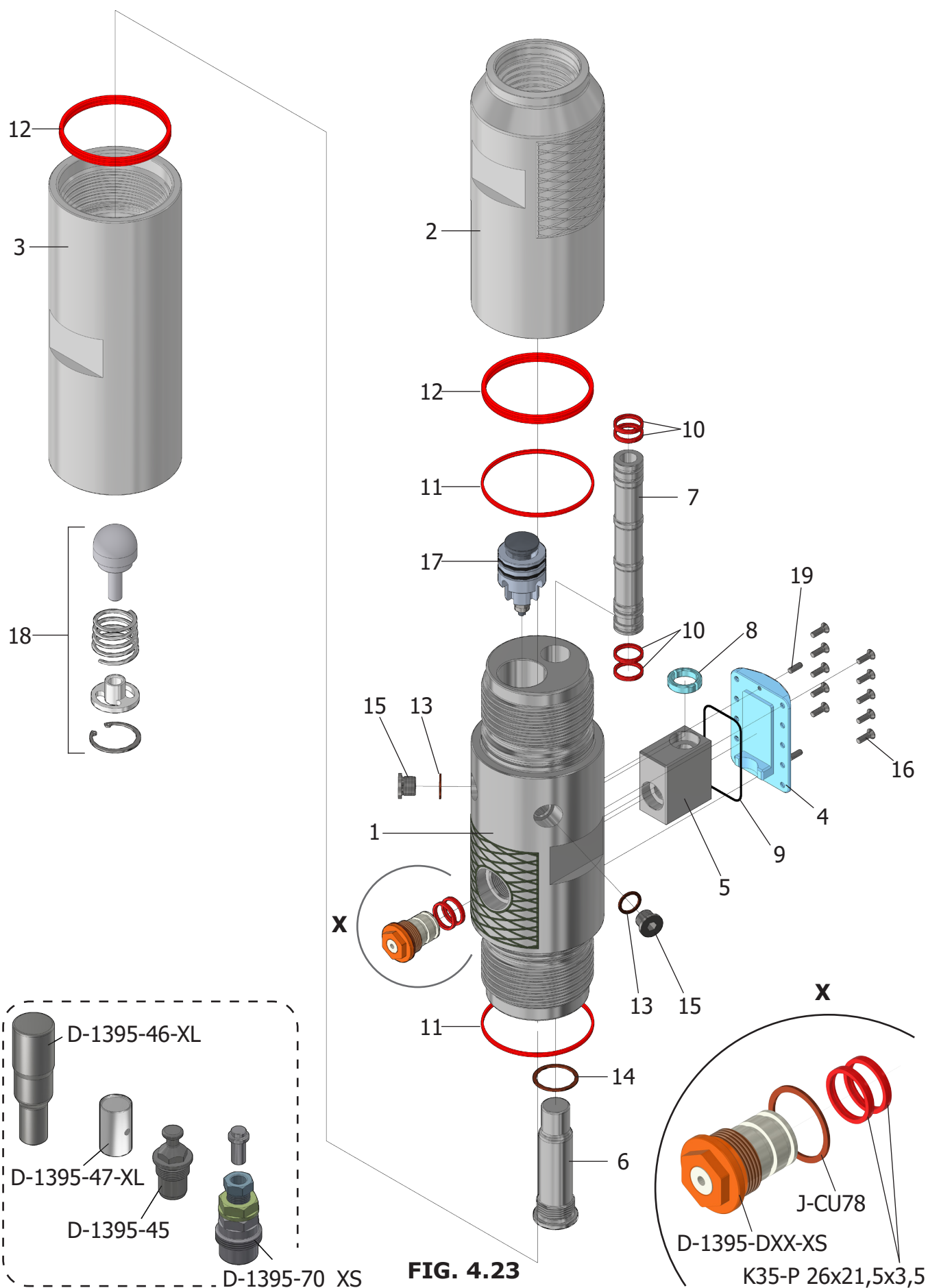
(\*) ASSEMBLY TOOLS



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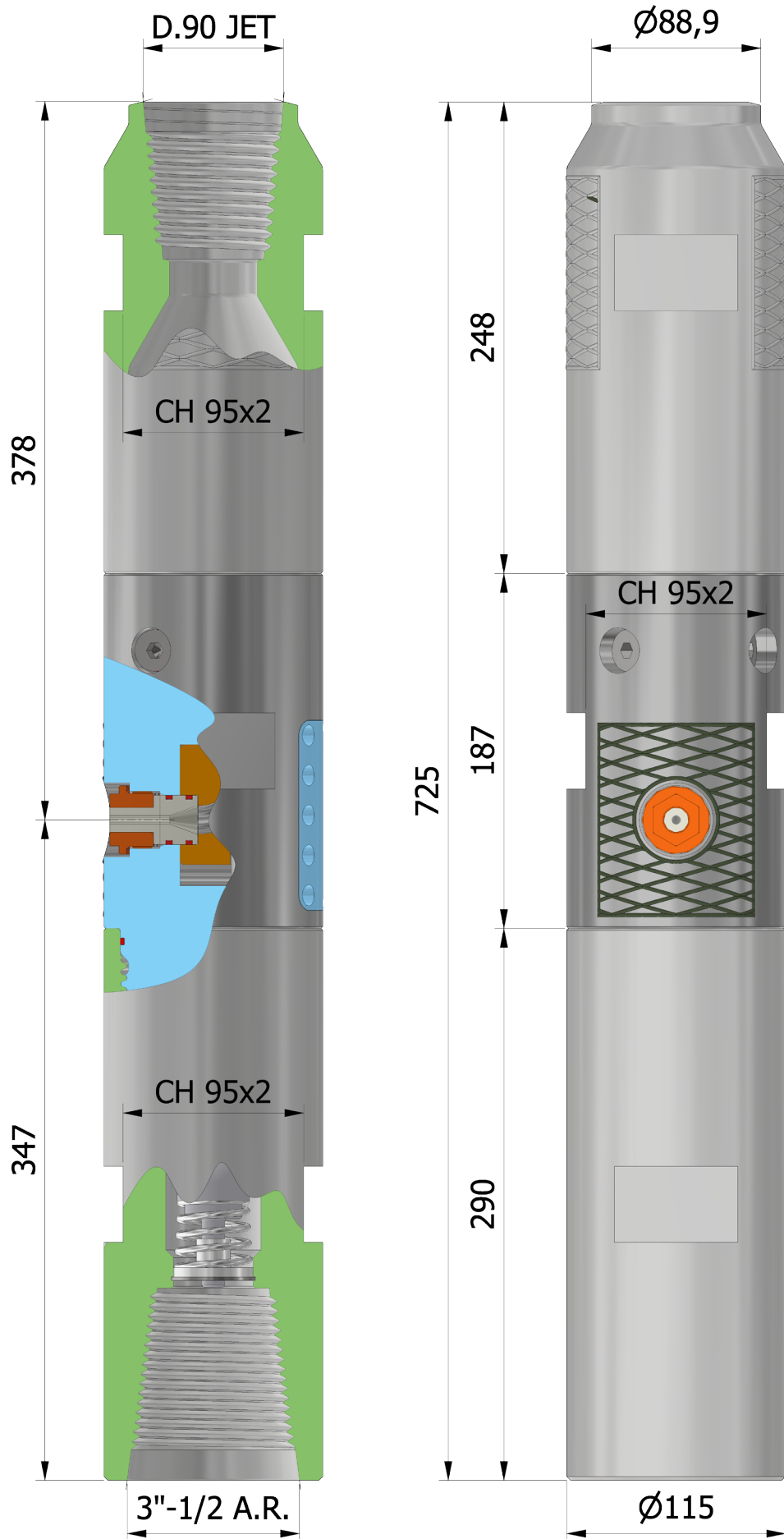
## 4.23 D.90 S.T.R.A.JET XS SINGLE FLUID NOZZLE HOLDER



J-889K470-XS: D.90 S.T.R.A.JET XS SINGLE FLUID NOZZLE HOLDER (REF. FIG. 4.23)

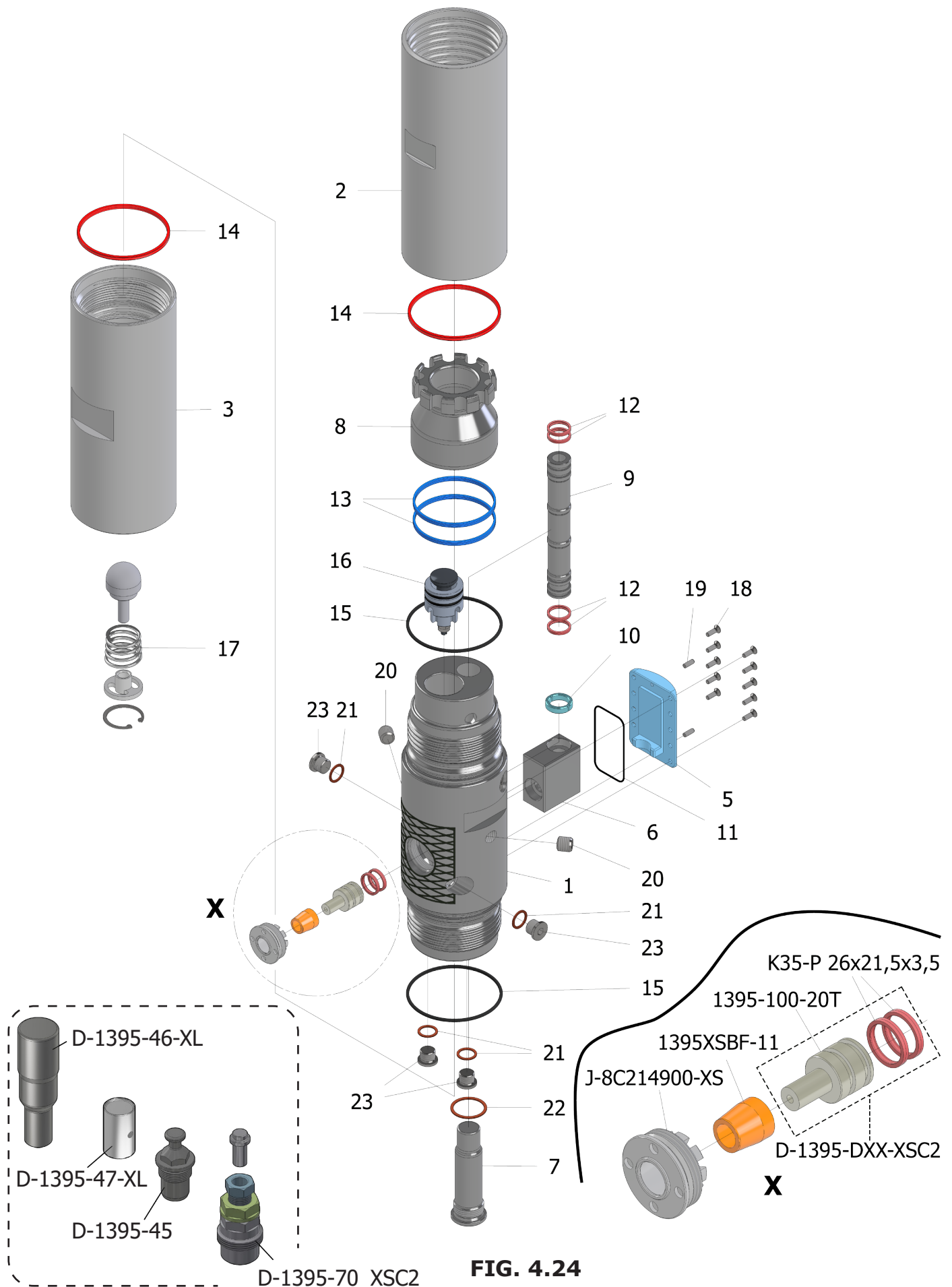
| REF. No. | CODICE CODE        | DESCRIZIONE                        | DESCRIPTION                        | QTY | NOTE |
|----------|--------------------|------------------------------------|------------------------------------|-----|------|
| 1        | D-1395XS-1         | CORPO MONITOR STRAJET XS MONO      | NOZZLE HOLDER XS BODY              | 1   |      |
| 2        | D-1395XS-2         | CORPO SUP. STRAJET XS MONO         | NOZZLE HOLDER XS UPPER BODY        | 1   |      |
| 3        | D-1395XS-3         | RACCORDO INF. STRAJET XS MONO      | NOZZLE H. XS LOWER ADAPTER         | 1   |      |
| 4        | D-1395XS-5         | SPORTELLLO STRAJET XS MONO         | STRAJET XS PORT                    | 1   |      |
| 5        | D-1395-100-12      | RACCORDO ID.15 STRAJET             | ID.15 TUNGSTEN CARBIDE DUCT        | 1   |      |
| 6        | D-1395-100-15      | TAPPO DI FERMO RACCORDO ID.15      | ID.15 STOP PLUG                    | 1   |      |
| 7        | D-1395-100-22      | CONDOTTO INT. ID.15 STRAJET        | STRAJET ID.15 INNER DUCT           | 1   |      |
| 8        | D-1395-100-23      | MEZZELUNE FERMO COND. INT. ID.15   | HALF RINGS ID.15 INNER DUCT        | 1   |      |
| 9        | D-1395-100-24      | GUARN. SPORTELLLO STRA JET XL      | XL PORT SEAL                       | 1   |      |
| 10       | K35-P21.50X26L3.5  | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 4   |      |
| 11       | K35-P93.4X97.9X3.5 | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 12       | R15-P89X97X7.7     | GUARN. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 13       | J-CU38             | GUARNIZIONE RAME 3/8"              | 3/8" COPPER SEAL                   | 2   |      |
| 14       | J-CU100            | GUARNIZIONE RAME 1"                | 1" COPPER SEAL                     | 1   |      |
| 15       | J-J13TP038         | TAPPO M. 3/8 ESAGONO               | 3/8" MALE PLUG                     | 2   |      |
| 16       | 5933M5X16P08109ZB  | VITE TPSEI M5X16 UNI5933 10.9 ZB   | M5x16 UNI5933 COUNTERSUNK SCREW    | 10  |      |
| 17       | J-J0NTPC70         | VALVOLA AUT. 70 BAR CILINDRICA     | CYLINDRICAL AUTOMATIC VALVE 70 BAR | 1   |      |
| 18       | J-JOVNR112         | VALV. N/RET. JET C2 114            | C2 114 NO-RETURN VALVE             | 1   |      |
| 19       | 5923M5X14P8H45GR   | VSTCE PIANA 5X14 UNI5923 H45 GR    | M5x14 UNI5923 FLAT SET SCREW       | 2   |      |
| -        | D-1395-45          | PERNO ALLINEAMENTO RACCORDO        | CARBIDE DUCT ALIGNEMENT PLUG       | -   | (*)  |
| -        | D-1395-46-XL       | ATTREZZO ESTRAZ. INSERTO CARBURO   | INNER DUCT EXTRACTOR               | -   | (*)  |
| -        | D-1395-47-XL       | ATTREZZO DI SPINTA INSERTO CARBURO | CARBIDE DUCT PUSHING TOOL          | -   | (*)  |
| -        | D-1395-70_XS       | ESTRATTORE PER UGELLO              | GROUT NOZZLE EXTRACTOR             | -   | (*)  |

(\*) ASSEMBLY TOOLS



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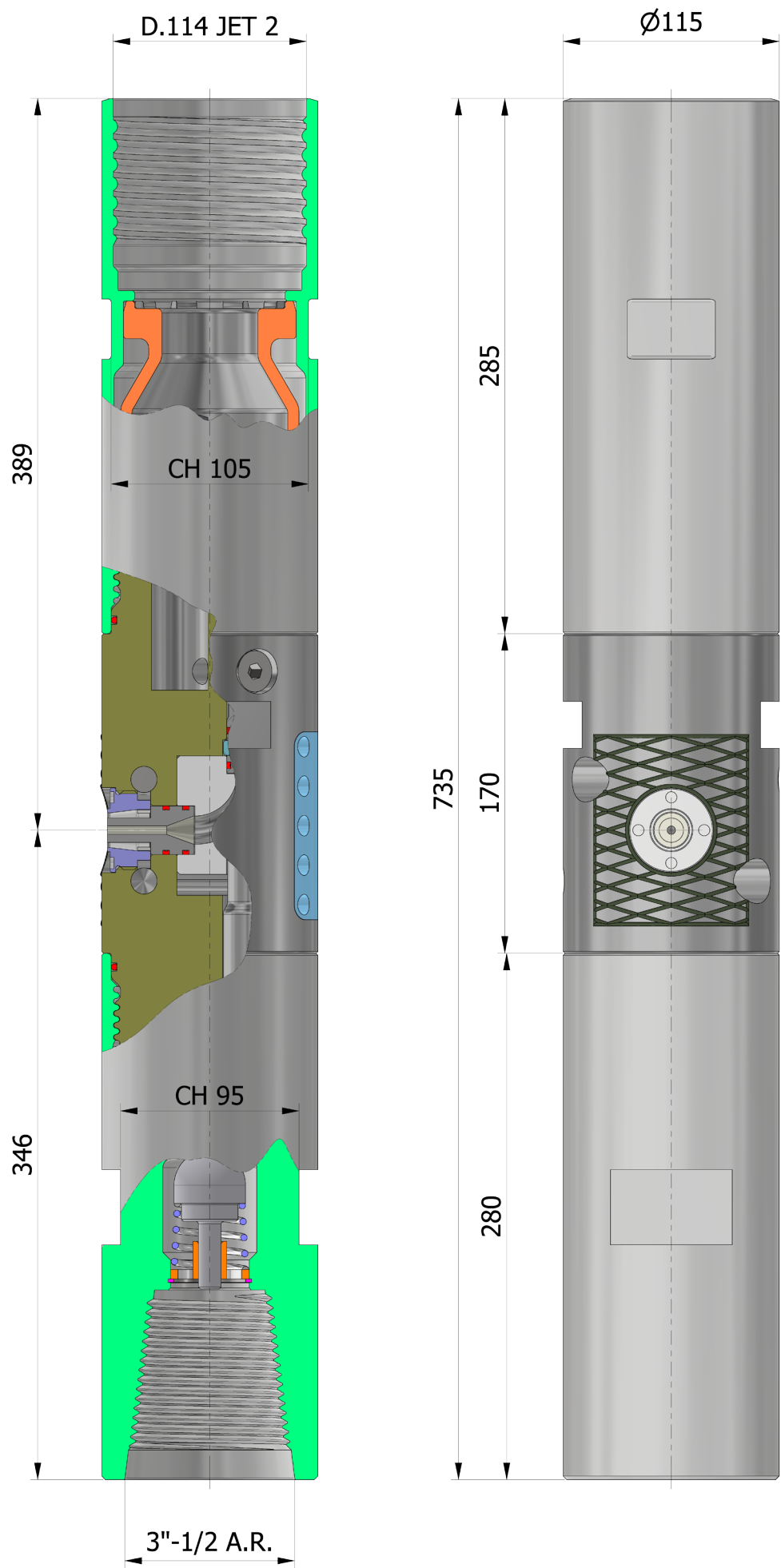
#### 4.24 D.114 S.T.R.A.JET XS DOUBLE FLUID NOZZLE HOLDER



J-1C212470-XS: D.114 S.T.R.A.JET XS DOUBLE FLUID NOZZLE HOLDER (REF. FIG. 4.24)

| REF. No. | CODICE CODE         | DESCRIZIONE                          | DESCRIPTION                        | QTY | NOTE |
|----------|---------------------|--------------------------------------|------------------------------------|-----|------|
| 1        | 1395XSBF-1          | CORPO MONITOR STRAJET XS BF          | NOZZLE HOLDER XSBF BODY            | 1   |      |
| 2        | 1395XSBF-2          | CORPO SUPERIORE STRAJET XS BF        | NOZZLE HOLDER XSBF UPPER BODY      | 1   |      |
| 3        | 1395XSBF-3          | RACCORDO INF. MONITOR XS BF          | NOZ. HOLDER XSBF LOWER ADAPT.      | 1   |      |
| 5        | 1395XS-5            | SPORTELLLO STRAJET XS MONO           | STRAJET XS PORT                    | 1   |      |
| 6        | 1395-100-12         | RACCORDO ID.15 (620U0208)            | ID.15 TUNGSTEN CARBIDE DUCT        | 1   |      |
| 7        | 1395-100-15         | TAPPO DI FERMO RACCORDO ID.15        | ID.15 STOP PLUG                    | 1   |      |
| 8        | 2028D-2             | BICCHIERE INT. ADATTATORE SUP.       | INNER ADAPTER FOR UPPER BODY       | 1   |      |
| 9        | 1395-100-22         | CONDOTTO INT. ID.15 (620U0209)       | ID.15 INNER DUCT                   | 1   |      |
| 10       | 1395-100-23         | MEZZELUNE CONDOTTO INT. ID.15        | HALF RINGS ID.15 INNER DUCT        | 1   |      |
| 11       | 1395-100-24         | O-RING s=1.78 L=245 (OR041)          | PORT SEAL                          | 1   |      |
| 12       | K35-P 26x21.5x3.5   | GUARNIZ. POLIURETANO 95 SHORE A      | 95 SHORE A POLYURETHANE SEAL       | 4   |      |
| 13       | OP 85.5 90.5 4.5    | GUARNIZ. ASTON TIPO OP (VER. b)      | OP SEAL (VER. b)                   | 2   |      |
| 14       | S35-P 95x101.2x4.5  | GUARNIZ. POLIURETANO 95 SHORE-A      | 95 SHORE A POLYURETHANE SEAL       | 2   |      |
| 15       | OR 241              | O-RING                               | O-RING SEAL                        | 2   |      |
| 16       | J-J01TPC70 (D-1970) | VALV. AUT. TIPO CIL. 70 BAR C2 D.114 | CYLINDRICAL AUTOMATIC VALVE 70 BAR | 1   |      |
| 17       | J-JOVNR112          | VALVOLA NON RITORNO COMPLETA         | C2 114 NO-RETURN VALVE             | 1   |      |
| 18       | 5933M5X16P08109ZB   | VITE TPSEI M5X16 UNI5933 10.9 ZB     | M5x16 UNI5933 COUNTERSUNK SCREW    | 10  |      |
| 19       | 5923M5X14P8H45GR    | VSTCE PIANA 5X14 UNI5923 H45 GR      | M5x14 UNI5923 FLAT SET SCREW       | 2   |      |
| 20       | 5923M16X16P8H45GR   | VSTCE PIANA 16X16 UNI5923 H45 GR     | M16x16 UNI5923 FLAT SET SCREW      | 2   |      |
| 21       | J-CU38              | GUARNIZIONE RAME 3/8"                | 3/8" COPPER SEAL                   | 6   |      |
| 22       | J-CU100             | GUARNIZIONE RAME 1"                  | 1" COPPER SEAL                     | 1   |      |
| 23       | J-J13TP038          | TAPPO M. 3/8 ESAGONO                 | 3/8" MALE PLUG                     | 6   |      |
| -        | D-1395-45           | PERNO ALLINEAMENTO RACCORDO          | CARBIDE DUCT ALIGNEMENT PLUG       | -   | (*)  |
| -        | D-1395-46-XL        | ATTREZZO ESTRAZ. INSERTO CARBURO     | INNER DUCT EXTRACTOR               | -   | (*)  |
| -        | D-1395-47-XL        | ATTREZZO DI SPINTA INSERTO CARBURO   | CARBIDE DUCT PUSHING TOOL          | -   | (*)  |
| -        | D-1395-70-XSC2      | ESTRATTORE PER UGELLO                | GROUT NOZZLE EXTRACTOR             | -   | (*)  |

(\*) ASSEMBLY TOOLS



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**FIG. 4.25**

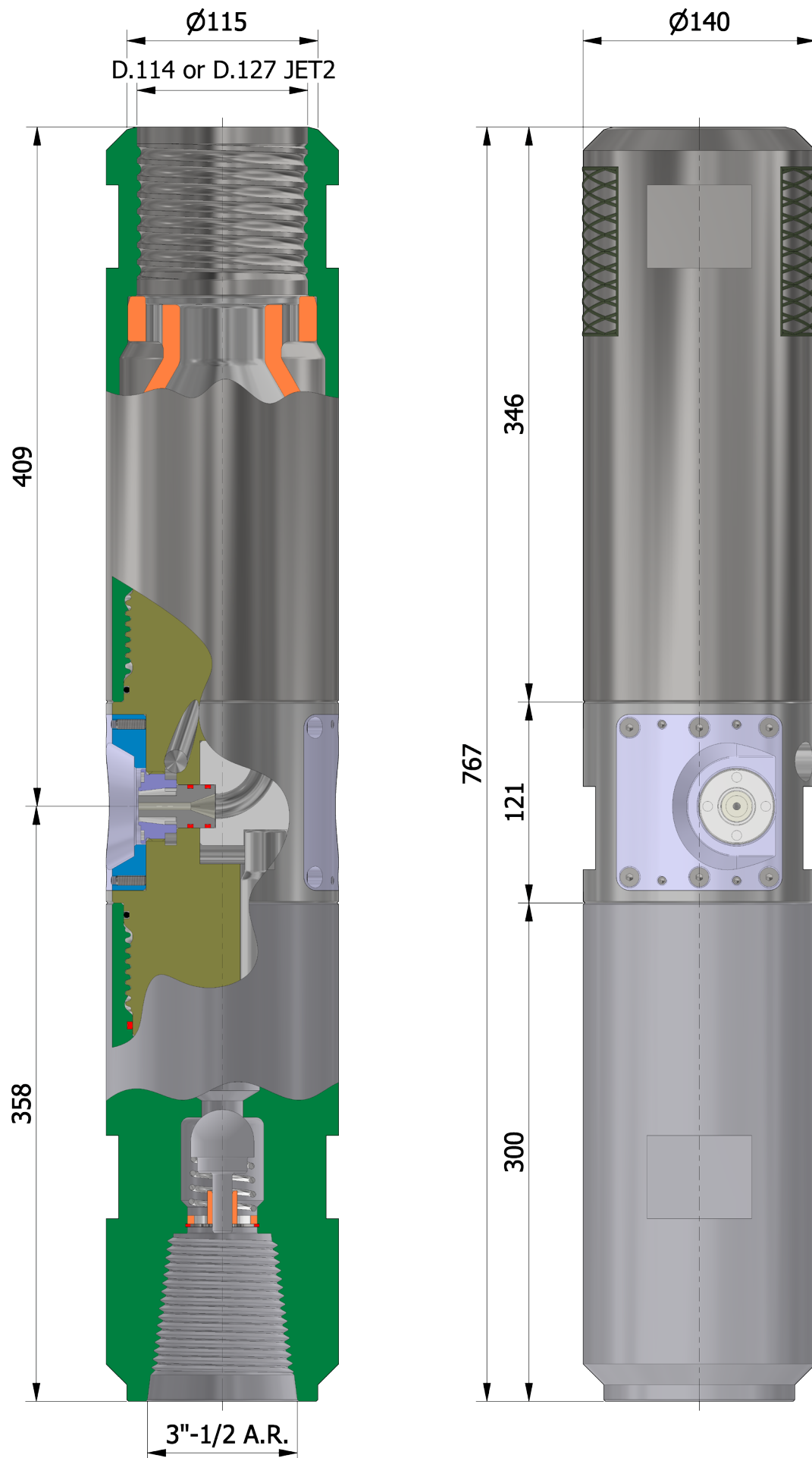
J-1C212472-XS (D.114) / J-1C212472-XSJ (D.127) STRAJET XS DOUBLE FLUID NOZZLE HOLDER (DOUBLE NOZZLE) REF. FIG. 4.25

| REF. No. | CODICE CODE         | DESCRIZIONE                          | DESCRIPTION                        | QTY | NOTE  |
|----------|---------------------|--------------------------------------|------------------------------------|-----|-------|
| 1        | 1395DUXS-1          | CORPO MONITOR DOPPIO UGELLO XS       | NOZZLE HOLDER 2 NOZZLES XS BODY    | 1   |       |
| 2A       | 1395-100-2          | CORPO SUP. MONITOR D.114             | NOZZLE HOLDER UPPER BODY D.114     | 1   | (*)   |
| 2B       | 1395-100-2J         | CORPO SUP. MONITOR D.127             | NOZZLE HOLDER UPPER BODY D.127     | 1   | (**)  |
| 3        | 1395-100-3          | RACCORDO INFERIORE                   | LOWER ADAPTER                      | 1   |       |
| 4        | 1395-100-4          | BICCHIERE INTERNO                    | INNER ADAPTER                      | 1   |       |
| 5        | 1395DUXS-5          | SPORTELLLO STRAJET 2 UGELLI XS       | STRAJET PORT 2 NOZZLES XS          | 2   |       |
| 6        | 1395-100-12         | RACCORDO ID.15 (620U0208)            | ID.15 TUNGSTEN CARBIDE DUCT        | 2   |       |
| 7        | 1395-100-15         | TAPPO DI FERMO RACCORDO ID.15        | ID.15 STOP PLUG                    | 2   |       |
| 8        | 1395-100-22         | CONDOTTO INT. ID.15 (620U0209)       | ID.15 INNER DUCT                   | 2   |       |
| 9        | 1395-100-23         | MEZZELUNE CONDOTTO INT. ID.15        | HALF RINGS ID.15 INNER DUCT        | 2   |       |
| 10       | K35-P 26x21.5x3.5   | GUARN. POLIURETANO 95 SHORE A        | 95 SHORE A POLYURETHANE SEAL       | 8   |       |
| 11       | S35-P 105x111,2x4.5 | GUARN. POLIURETANO 95 SHORE A        | 95 SHORE A POLYURETHANE SEAL       | 2   |       |
| 12       | S35-P 117x123,2x4.5 | GUARN. POLIURETANO 95 SHORE A        | 95 SHORE A POLYURETHANE SEAL       | 2   |       |
| 13       | OR 248              | O-RING                               | O-RING SEAL                        | 2   |       |
| 14       | OR041               | O-RING                               | O-RING SEAL                        | 2   |       |
| 15       | J-CU38              | GUARNIZIONE RAME 3/8"                | 3/8" COPPER SEAL                   | 4   |       |
| 16       | J-CU100             | GUARNIZIONE RAME 1"                  | 1" COPPER SEAL                     | 2   |       |
| 17       | J-J13TP038          | TAPPO M. 3/8 ESAGONO                 | 3/8" MALE PLUG                     | 4   |       |
| 18       | 5933M6X20P1109ZB    | VITE TPSEI M6X20 UNI5933 10.9 ZB     | M6x20 UNI5933 COUNTERSUNK SCREW    | 12  |       |
| 19       | J-J01TPC70 (D-1970) | VALV. AUT. TIPO CIL. 70 BAR C2 D.114 | CYLINDRICAL AUTOMATIC VALVE 70 BAR | 1   |       |
| 20       | J-JOVNR112          | VALVOLA NON RITORNO COMPLETA         | C2 114 NO-RETURN VALVE             | 1   |       |
| 21       | 5923M6X18P1H45GR    | VSTCE PIANA M6x18 UNI5923 H45 GR     | M6x18 UNI5923 FLAT SET SCREW       | 8   |       |
| -        | D-1395-45           | PERNO ALLINEAMENTO RACCORDO          | CARBIDE DUCT ALIGNEMENT PLUG       | -   | (***) |
| -        | D-1395-46-XL        | ATTREZZO ESTRAZ. INSERTO CARBURO     | INNER DUCT EXTRACTOR               | -   | (***) |
| -        | D-1395-47-XL        | ATTREZZO DI SPINTA INSERTO CARBURO   | CARBIDE DUCT PUSHING TOOL          | -   | (***) |
| -        | D-1395-70-XSC2      | ESTRATTORE PER UGELLO                | GROUT NOZZLE EXTRACTOR             | -   | (***) |

(\*) USED FOR J-1C212472-XS (D.114 THREAD VERSION)

(\*\*) USED FOR J-1C212472-XSJ (D.127 THREAD VERSION)

(\*\*\*) ASSEMBLY TOOLS



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4.26 BIT ADAPTER C2 D.90 WITH NO RETURN VALVE J-8C214753

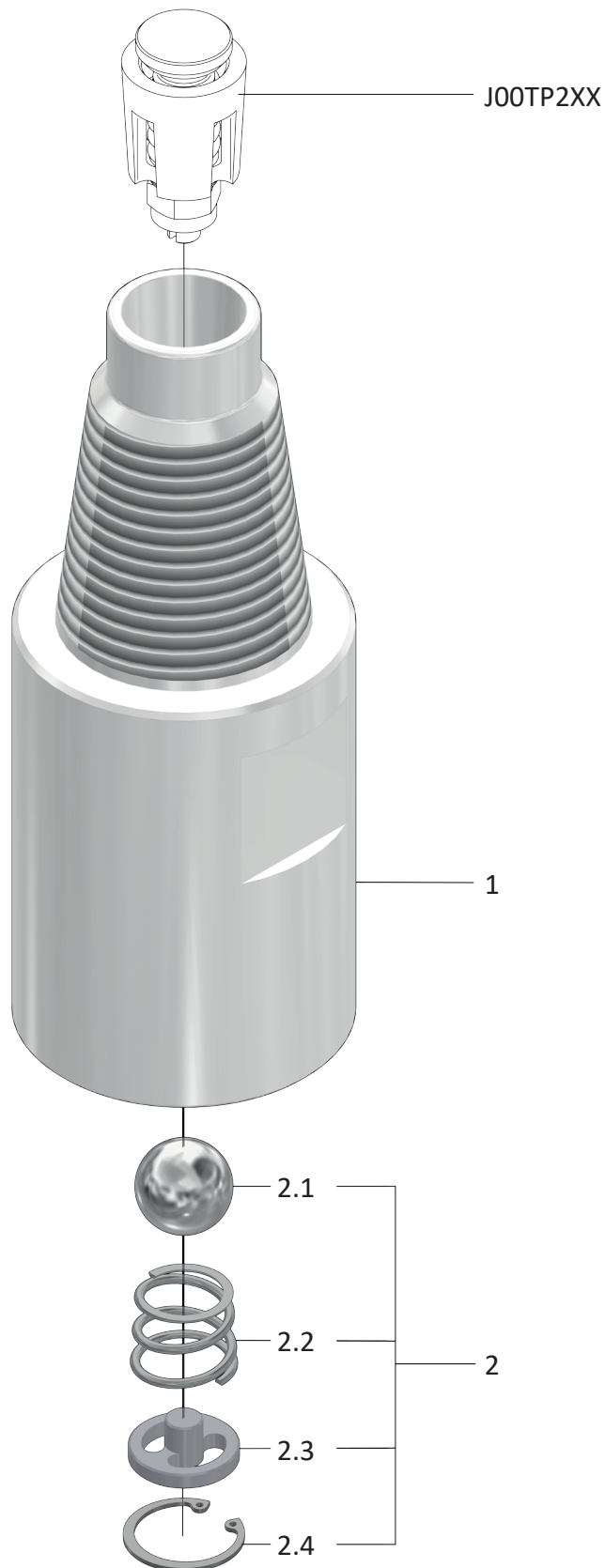
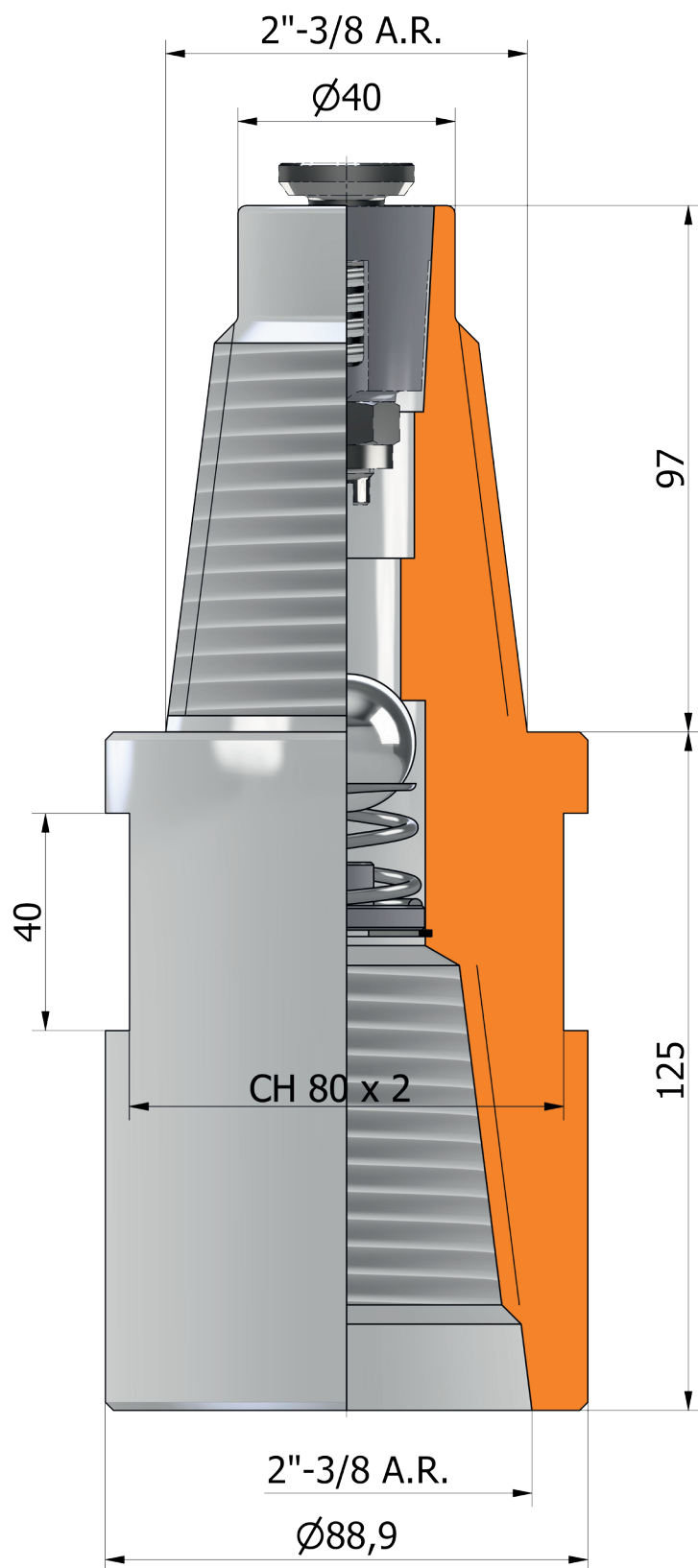


FIG. 4.26

J-8C214753 BIT ADAPTER C2 D.90 WITH NO-RETURN VALVE (REF. FIG. 4.26)

| REF. No. | CODICE CODE                | DESCRIZIONE                     | DESCRIPTION                         | QTY | NOTE |
|----------|----------------------------|---------------------------------|-------------------------------------|-----|------|
| 1        | D-525-11-1                 | CORPO PORTASCALPELLO D.90 C2    | D.90 C2 BIT ADAPTER BODY            | 1   |      |
| 2        | J-JOVNR000                 | VALVOLA NON RITORNO COMPLETA    | COMPLETE NO RETURN VALVE            | 1   |      |
| 2.1      | J-JOVNR001                 | SFERA ACCIAIO D. 1"             | STEEL BALL O.D. 1"                  |     | (1)  |
| 2.2      | J-JOVNR002                 | MOLLA CONICA D.28,5-25,5 L.28,5 | O.D.28,5-25,5 L.28,5 CONICAL SPRING |     | (1)  |
| 2.3      | J-JOVNR003<br>[D-525-11-2] | DISTANZIALE VALVOLA NON RITORNO | NO RETURN VALVE SPACER              |     | (1)  |
| 2.4      | 7437D.29S12                | ANELLO ELASTICO PER FORI D.29   | INTERNAL RETAINING RING D.29        |     | (1)  |

(1) PARTI INCLUDE NEL CODICE DI ASSIEME - PARTS INCLUDED IN THE ASSEMBLY CODE



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4.27 BIT ADAPTER C2 D.114 WITH NO RETURN VALVE J-1C212752

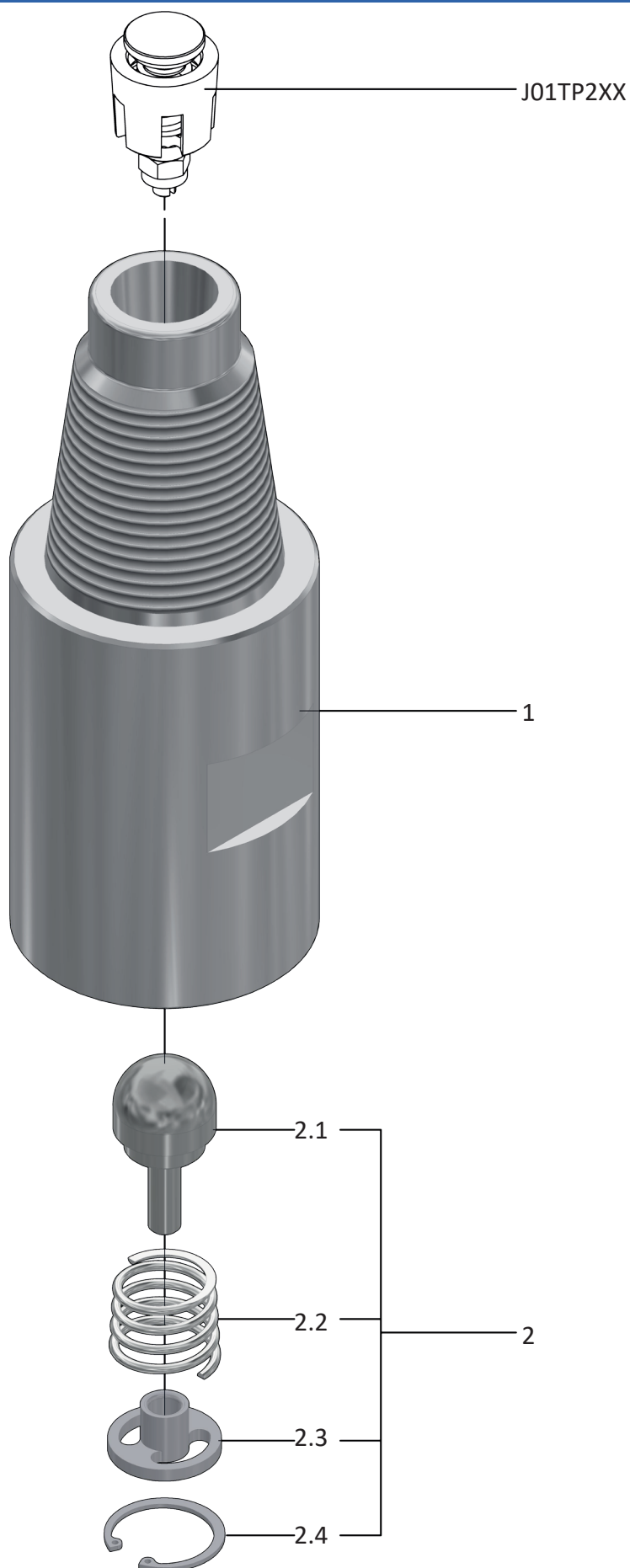
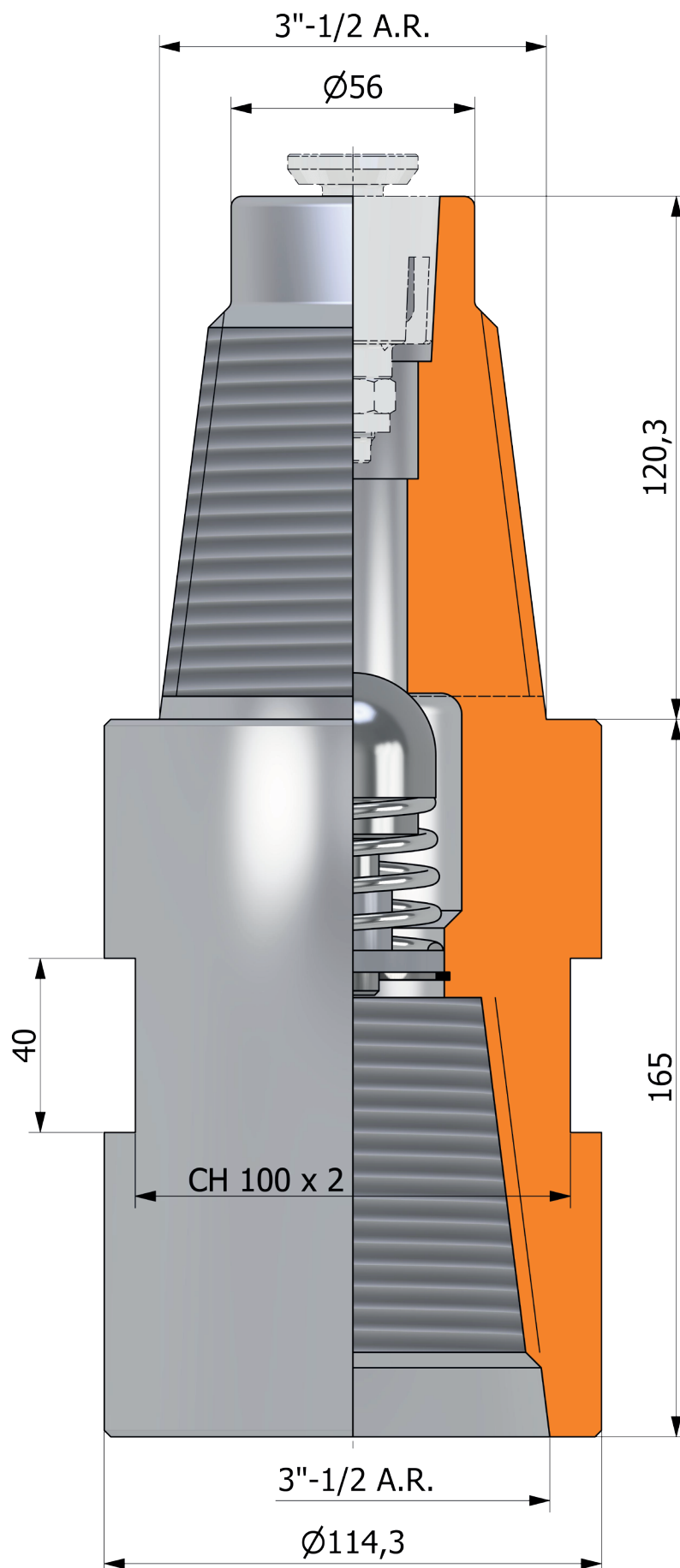


FIG. 4.27

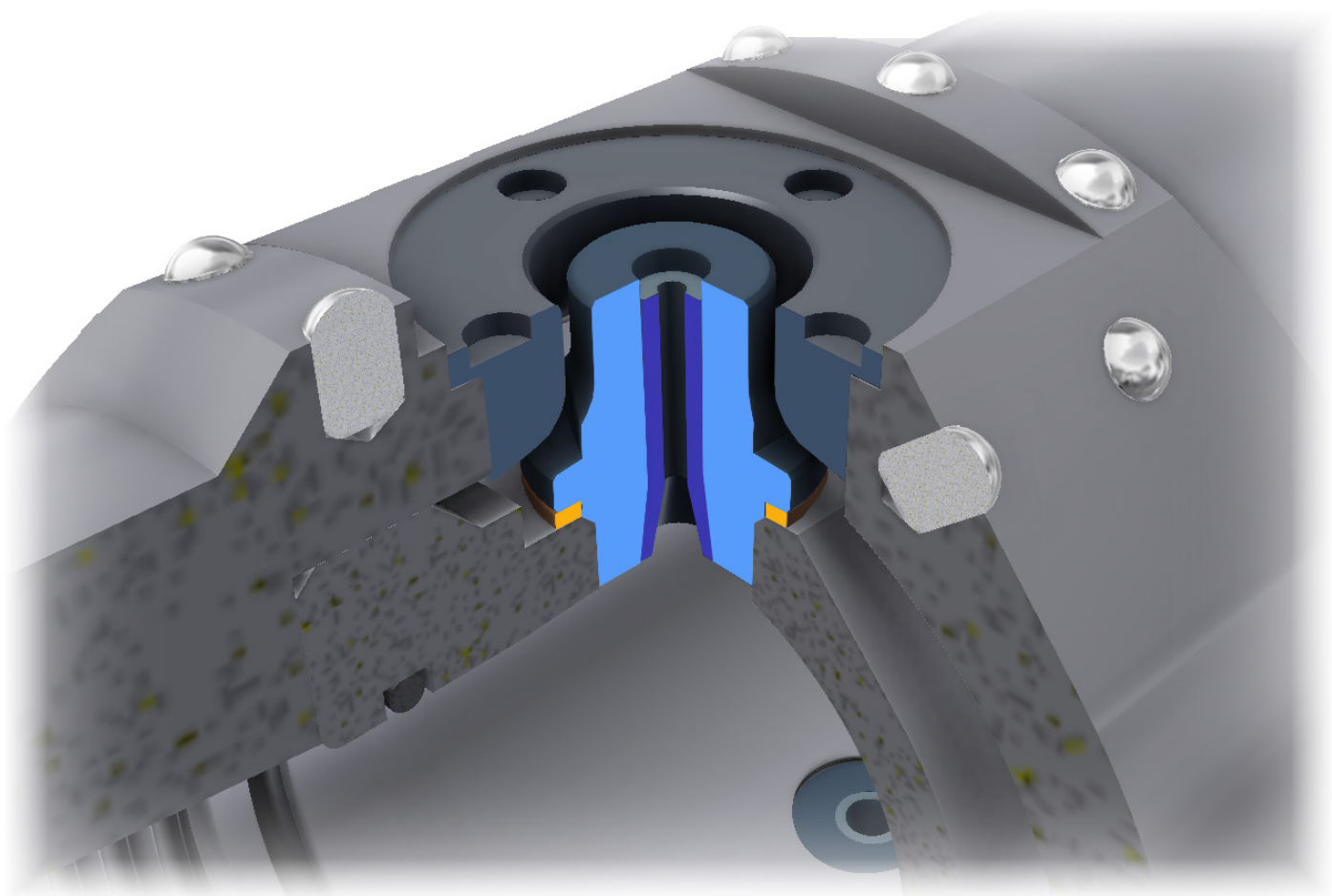
J-1C212752 BIT ADAPTER C2 D.114 WITH NO-RETURN VALVE (REF. FIG. 4.27)

| REF. No. | CODICE CODE  | DESCRIZIONE                           | DESCRIPTION                             | QTY | NOTE |
|----------|--------------|---------------------------------------|-----------------------------------------|-----|------|
| 1        | D-1107-1     | CORPO PORTASCALPELLO D.114 C2         | D.114 C2 BIT ADAPTER BODY               | 1   |      |
| 2        | J-JOVNR112   | VALVOLA NON RITORNO COMPLETA          | COMPLETE NO RETURN VALVE                | 1   |      |
| 2.1      | D-1107-3A    | TESTA VALVOLA                         | VALVE HEAD                              |     | (1)  |
| 2.2      | D-1109-1A    | MOLLA CONICA D1=41.5 D2=37.5<br>d=3.5 | CONICAL SPRING D1=41.5 D2=37.5<br>d=3.5 |     | (1)  |
| 2.3      | D-1107-2     | DISTANZIALE VALVOLA NON RITORNO       | NO RETURN VALVE SPACER                  |     | (1)  |
| 2.4      | 7437D.42S175 | ANELLO ELASTICO PER FORI D.42         | INTERNAL RETAINING RING D.42            |     | (1)  |

(1) PARTI INCLUDE NEL CODICE DI ASSIEME - PARTS INCLUDED IN THE ASSEMBLY CODE



## 5 UGELLI JETTING - JETTING NOZZLES



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## 5.1 GROUT NOZZLES CAPACITY

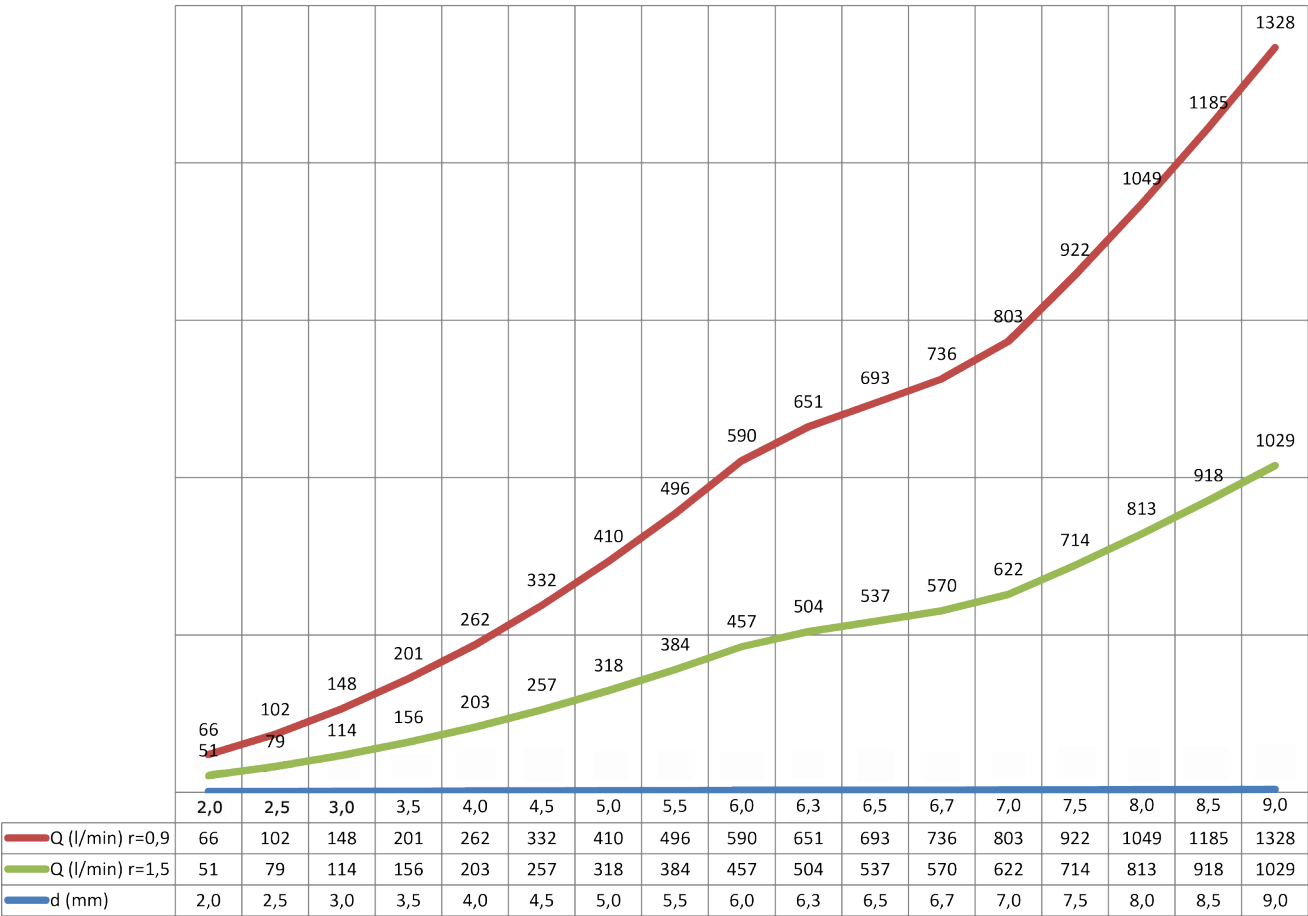
d= diametro ugello / nozzle diameter

r= peso specifico boiaccia cemento / grout mix density (Kg/dm<sup>3</sup>)

[Rapp./Ratio 1:1 r=1,5 Kg/dm<sup>3</sup>]

Pressione di riferimento / reference pressure: 400 bar

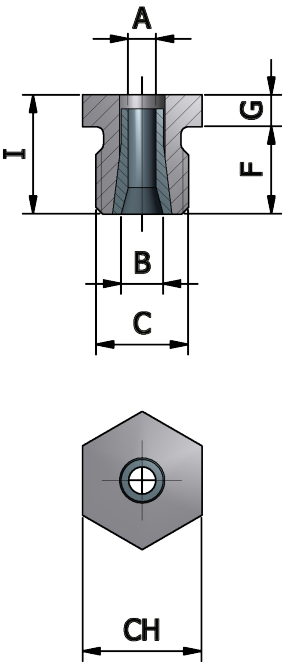
Q= portata cemento / grout mix capacity (l/min)



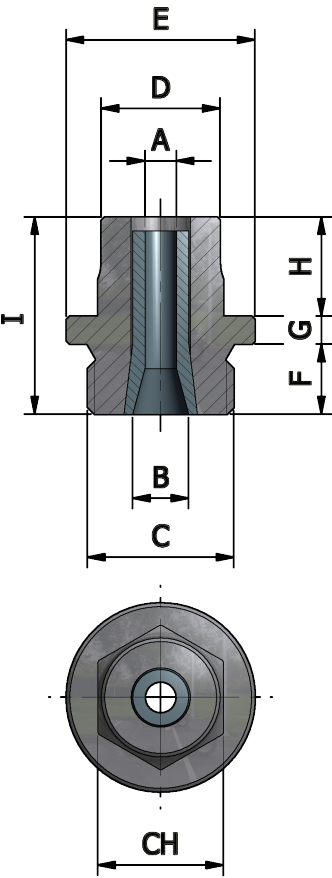
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5.2 GROUT NOZZLES DIMENSIONS

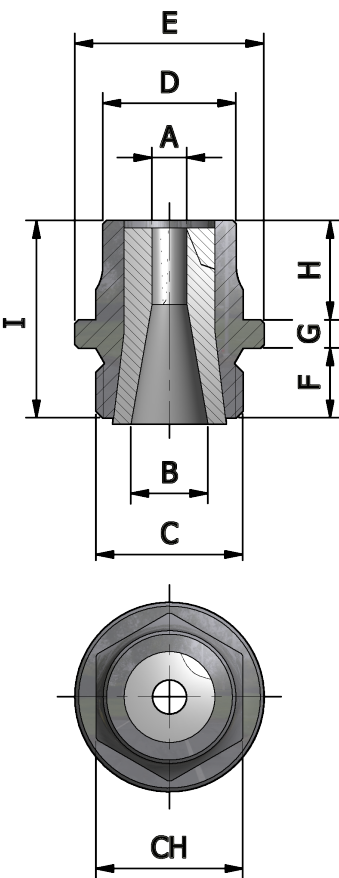
J-J00UCXXX



J-8C2149XX



J-8C2149XX-H

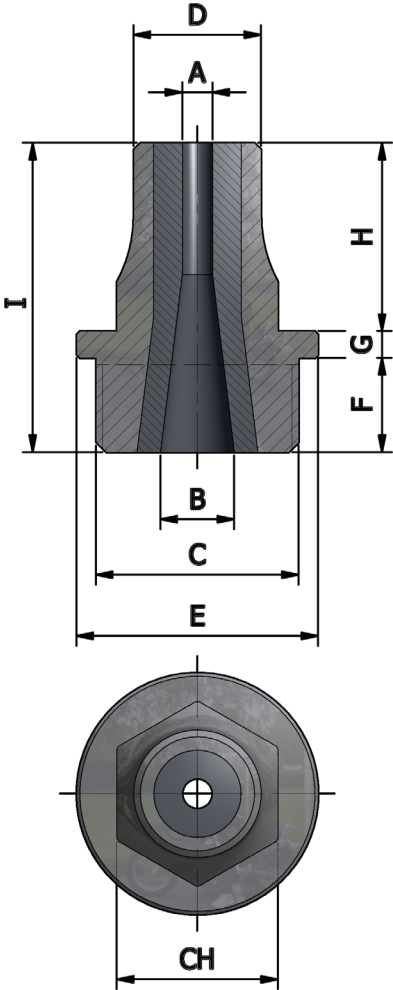


| CODICE CODE  | A       | B     | C      | D  | E  | F    | G   | H    | I    | CH |
|--------------|---------|-------|--------|----|----|------|-----|------|------|----|
| J-J00UCXXX   | 1,8-4,0 | 4,5-6 | 1/4" G | -  | -  | 12,5 | 4,5 | -    | 17   | 17 |
| J-8C2149XX   | 2,0-6,0 | 6-8   | 1/2" G | 17 | 27 | 10   | 4   | 14,2 | 28,2 | 18 |
| J-8C2149XX-H | 6,3-8,0 | 11    | 1/2" G | 19 | 27 | 10   | 4   | 14,2 | 28,2 | 21 |

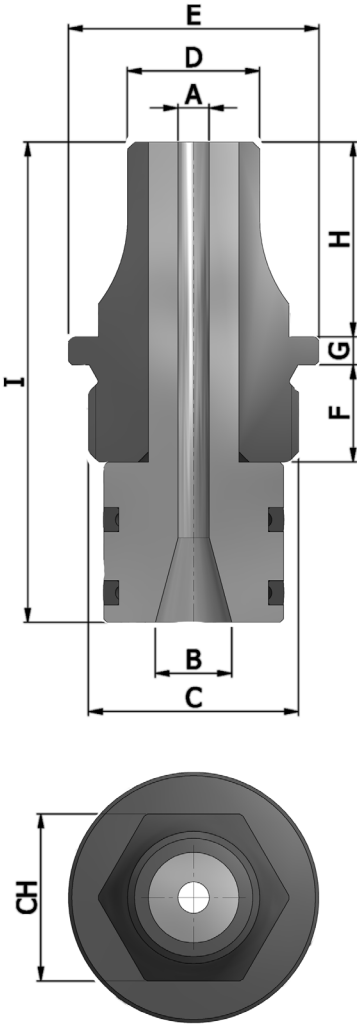




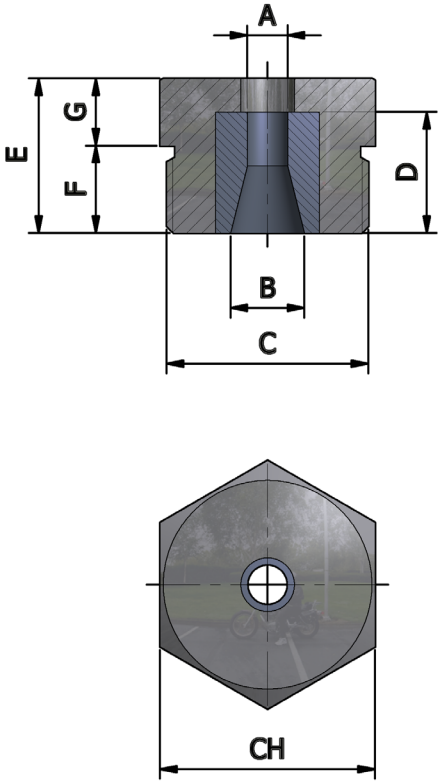
D-1555-4DXX



D-1395-DXX-IV  
D-1395-DXX-XL

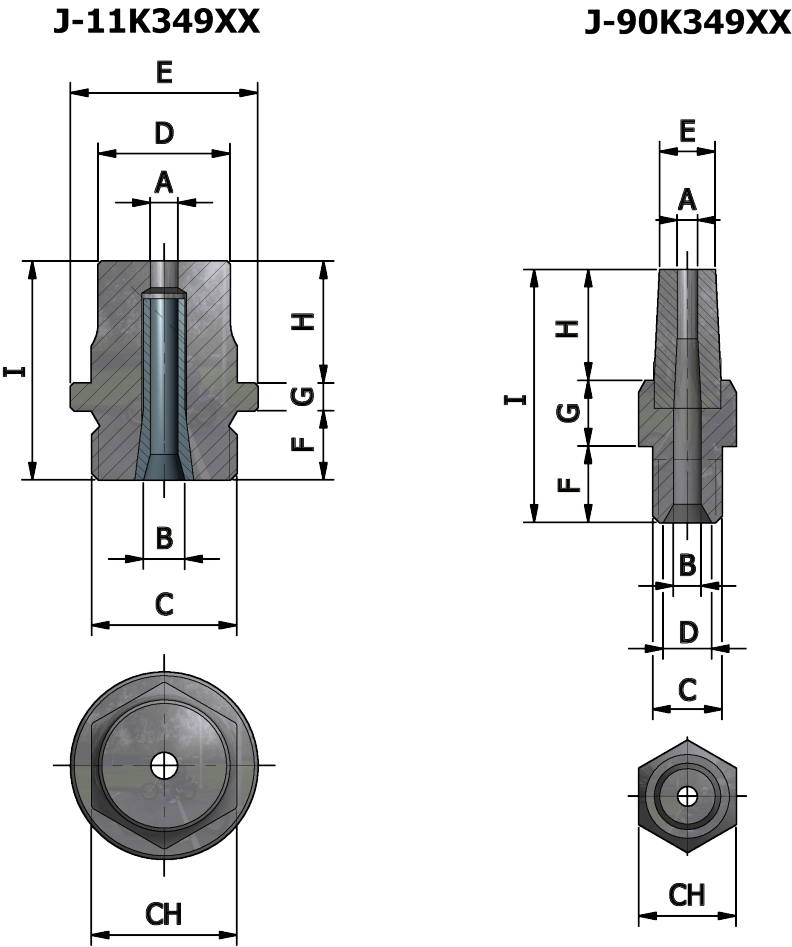


J-90K347XX



| CODICE<br>CODE | A       | B   | C       | D  | E  | F  | G  | H  | I  | CH |
|----------------|---------|-----|---------|----|----|----|----|----|----|----|
| D-1555-4DXX    | 6,0-9,0 | 8,5 | 7/8" G  | 19 | 36 | 14 | 4  | 28 | 46 | 24 |
| D-1395-DXX-IV  | 4,5-9,0 | 11  | 7/8" G  | 19 | 36 | 14 | 4  | 28 | 69 | 24 |
| D-1395-DXX-XL  | 4,5-9,0 | 15  | 7/8" G  | 19 | 36 | 14 | 4  | 28 | 69 | 24 |
| J-90K347XX     | 3,5-6,0 | 11  | M30x1,5 | 18 | 23 | 13 | 10 | -  | -  | 32 |

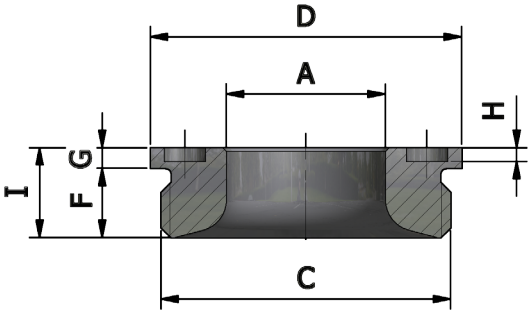
5.3 WATER NOZZLES DIMENSIONS



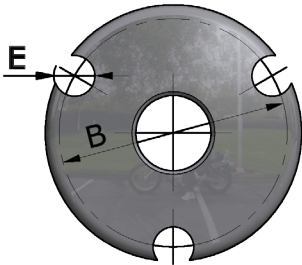
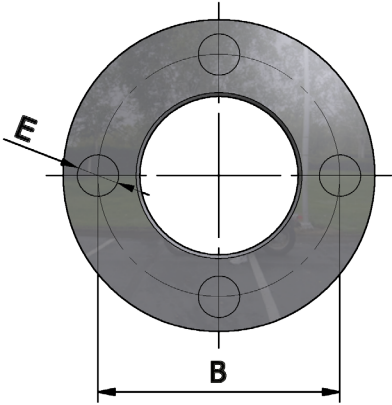
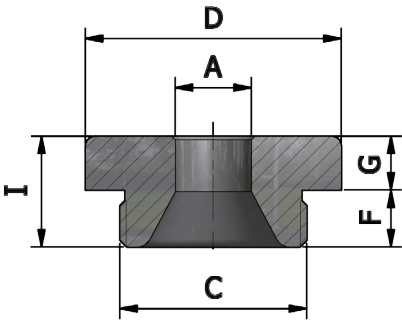
| CODICE<br>CODE | A       | B     | C       | D  | E  | F  | G   | H    | I    | CH |
|----------------|---------|-------|---------|----|----|----|-----|------|------|----|
| J-11K349XX     | 3,5-6,0 | 4,5-6 | 1/2" G  | 19 | 27 | 10 | 4   | 17,6 | 31,6 | 21 |
| J-90K349XX     | 2,0-3,5 | 4     | M10x1,5 | 7  | 8  | 11 | 9.5 | 16   | 36,5 | 14 |

5.4 AIR NOZZLES DIMENSIONS

J-8C2149XX  
J-11K349XX

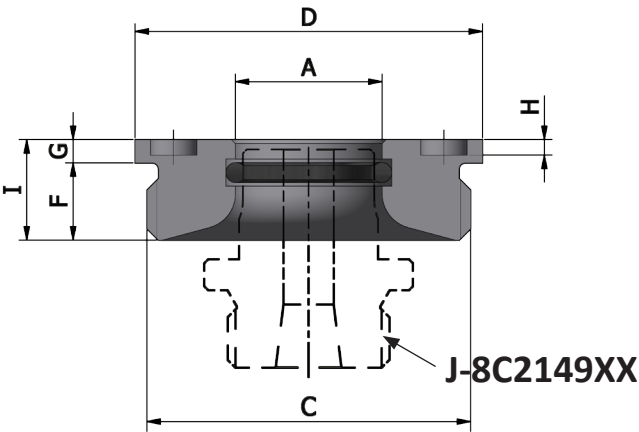


J-90K34900

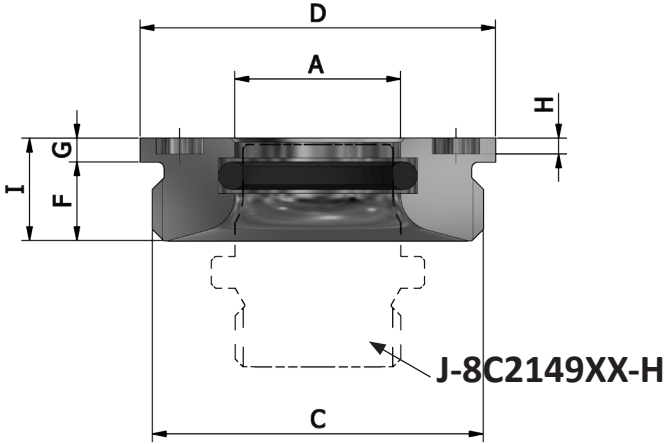


| CODICE<br>CODE           | A     | B  | C        | D  | E | F   | G   | H | I  |
|--------------------------|-------|----|----------|----|---|-----|-----|---|----|
| J-8C2149XX<br>J-11K349XX | 21-23 | 35 | 1"-1/4 G | 45 | 6 | 10  | 3   | 2 | 13 |
| J-90K34900               | 11    | 33 | M27x1,5  | 37 | 6 | 8,2 | 7,8 | - | 16 |

D-1171-33T19

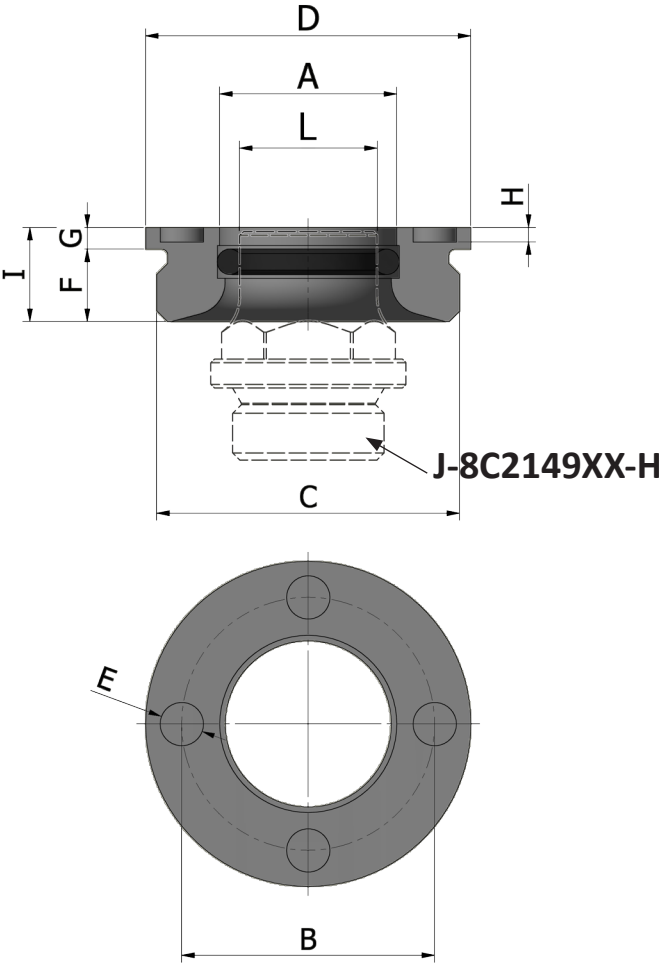


D-1171-33T

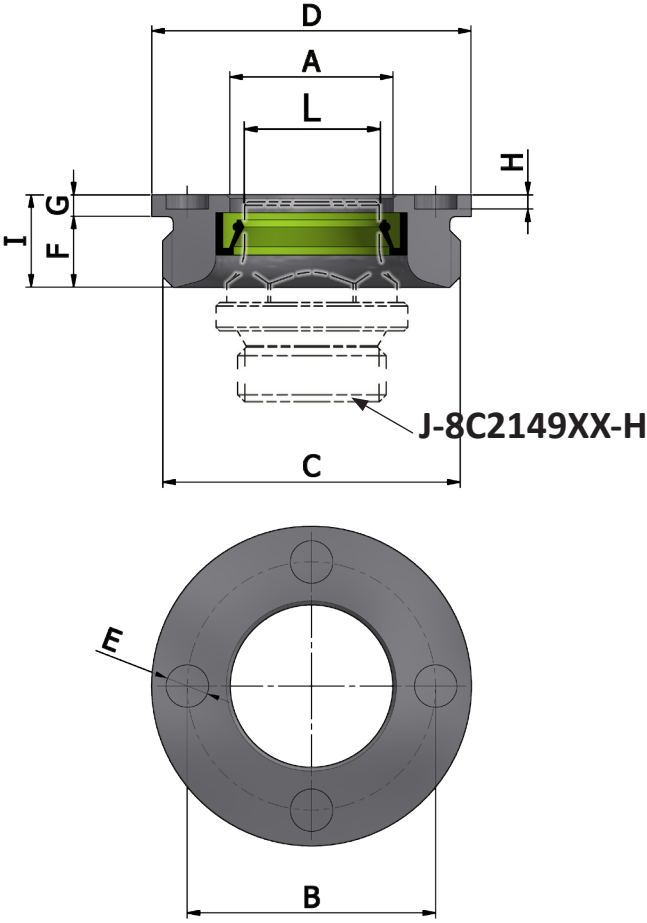


| CODICE<br>CODE | A  | B  | C        | D  | E | F  | G | H | I  |
|----------------|----|----|----------|----|---|----|---|---|----|
| D-1171-33T19   | 19 | 35 | 1"-1/4 G | 45 | 6 | 10 | 3 | 2 | 13 |
| D-1171-33T     | 21 | 33 | 1"-1/4 G | 45 | 6 | 10 | 3 | 2 | 13 |

D-1171-33TE

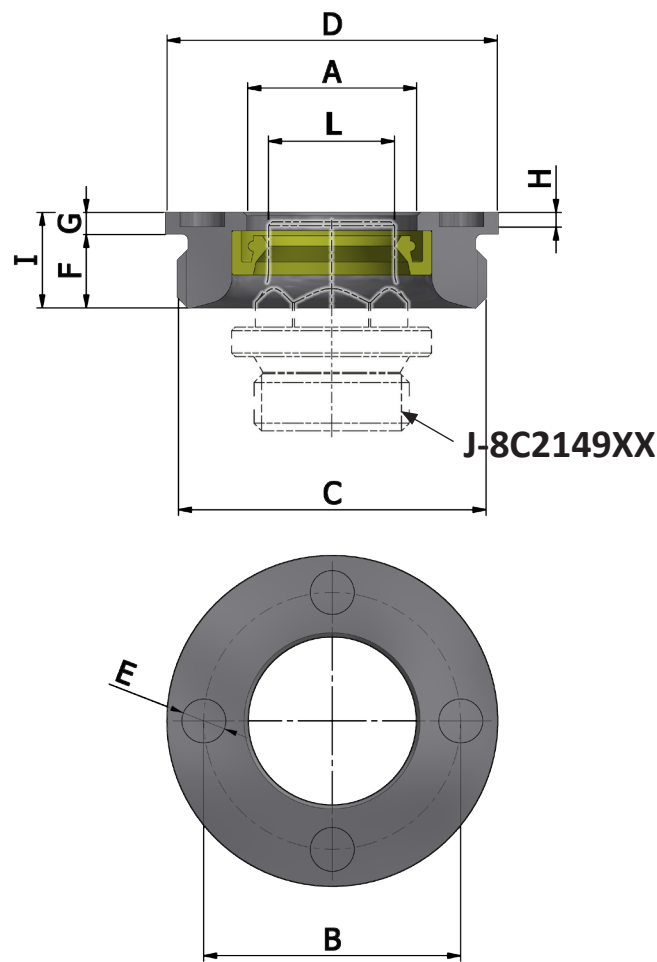


D-1354-970

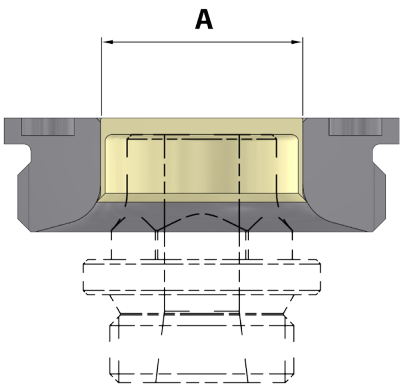
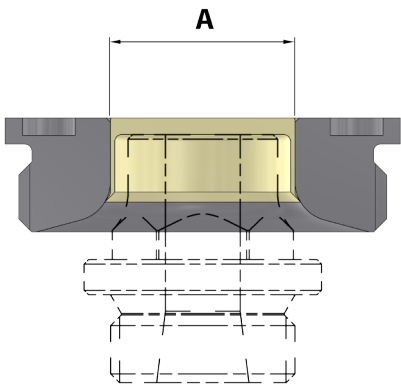


| CODICE<br>CODE | A    | B  | C        | D  | E | F  | G | H | I  | L  |
|----------------|------|----|----------|----|---|----|---|---|----|----|
| D-1171-33TE    | 24,5 | 35 | 1"-1/4 G | 45 | 6 | 10 | 3 | 2 | 13 | 19 |
| D-1354-970     | 23   | 33 | 1"-1/4 G | 45 | 6 | 10 | 3 | 2 | 13 | 19 |

D-1354-971

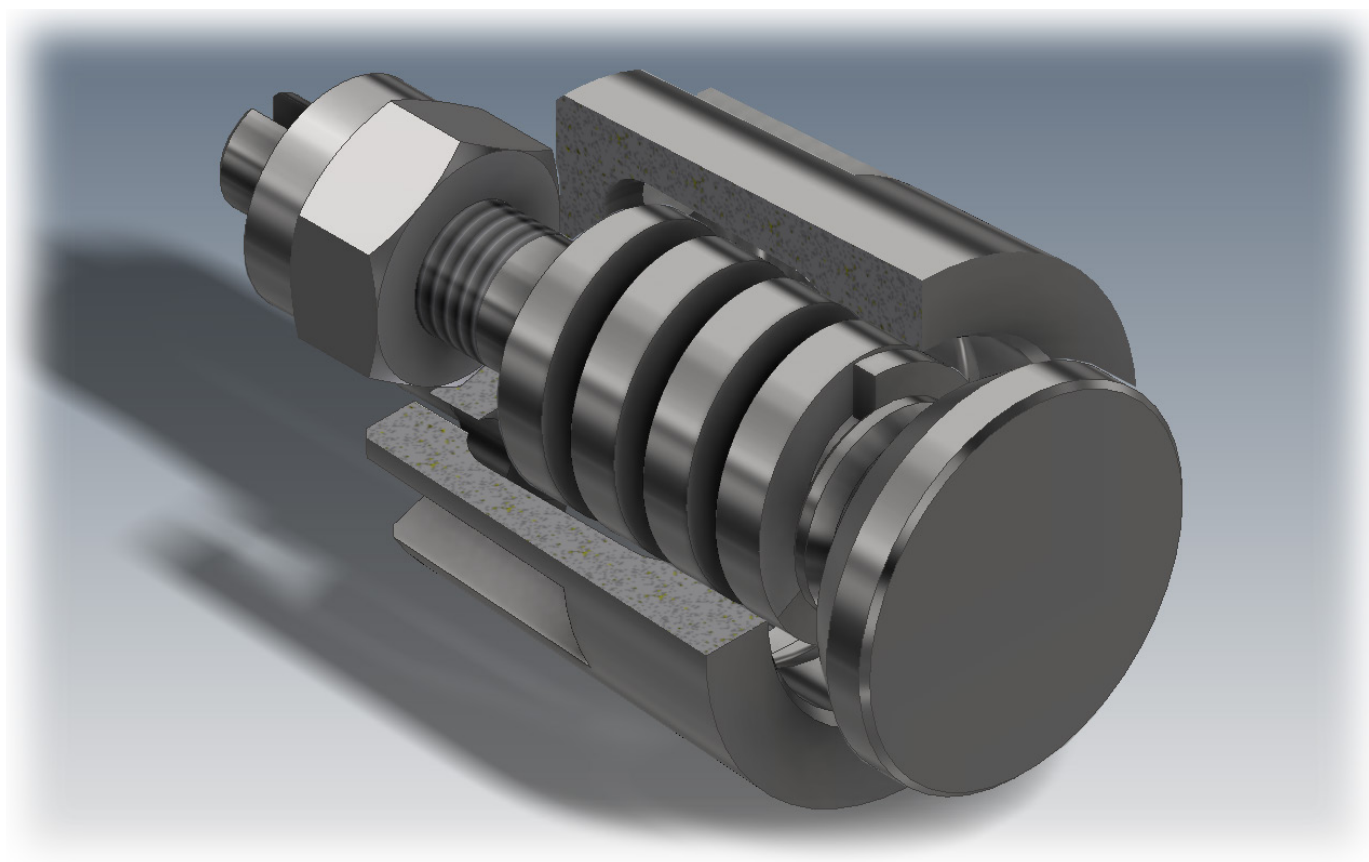


| CODICE<br>CODE | A  | B  | C        | D  | E | F  | G | H | I  | L  |
|----------------|----|----|----------|----|---|----|---|---|----|----|
| D-1354-971     | 23 | 33 | 1"-1/4 G | 45 | 6 | 10 | 3 | 2 | 13 | 17 |



| CODICE<br>CODE | A  |
|----------------|----|
| D-1376-A21     | 21 |
| D-1376-A23     | 23 |

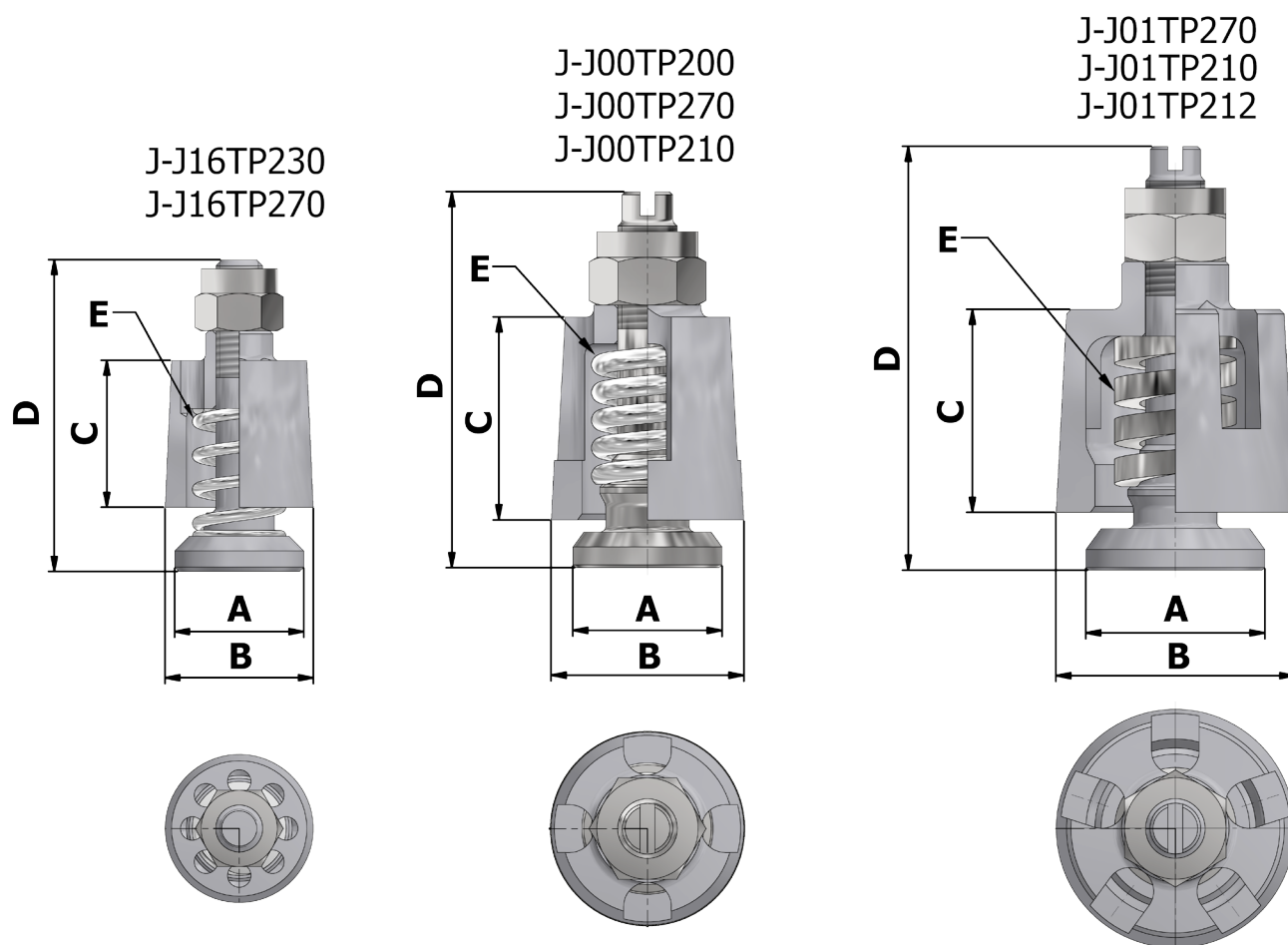
## 6 VALVOLE AUTOMATICHE - CHECK VALVES



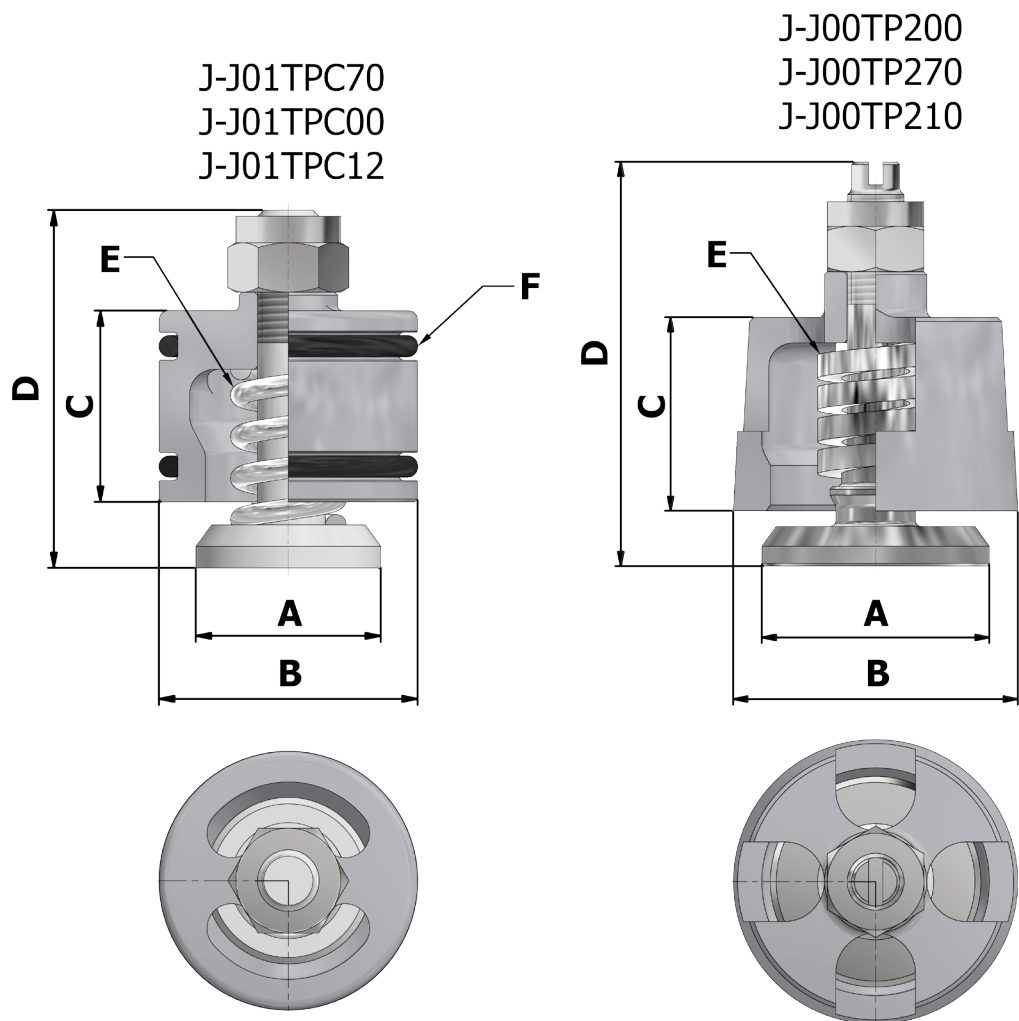


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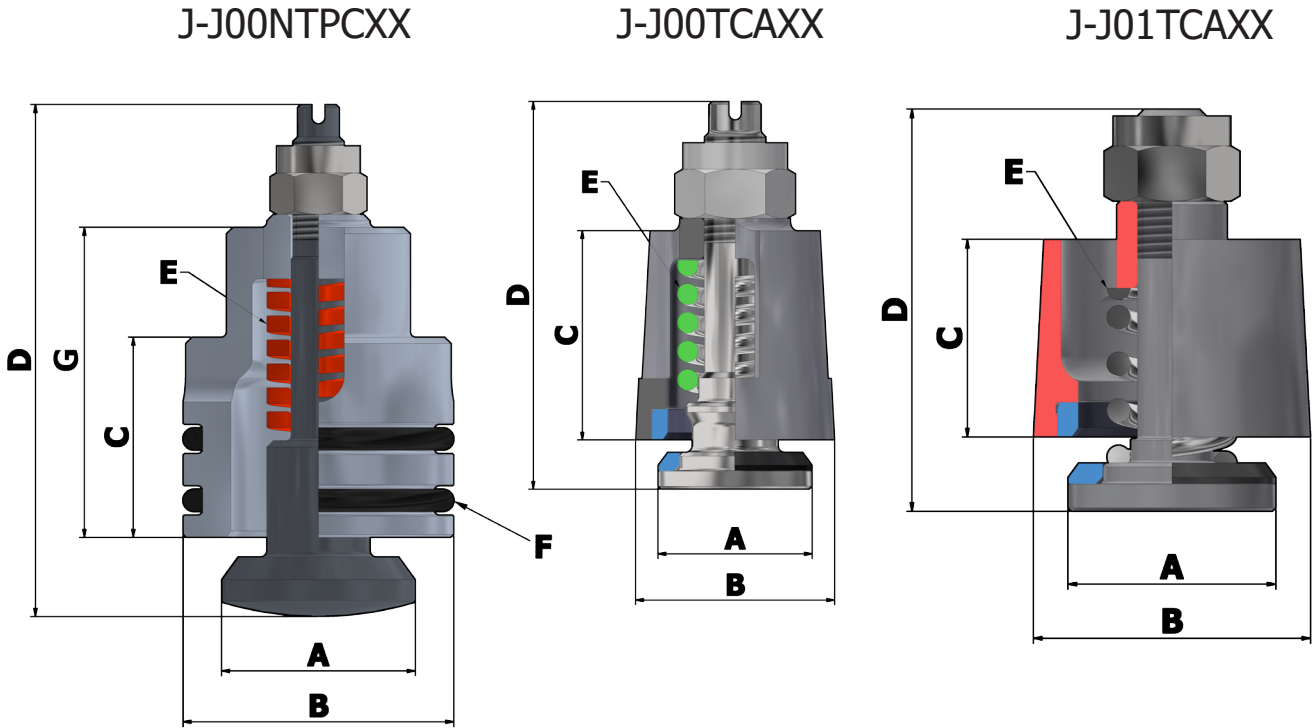
## 6.1 CHECK VALVES DIMENSIONS



| CODICE CODE | SYSTEMS                              | CLOSING PRESSURE (BAR) | A  | B    | C  | D  | E        | F |
|-------------|--------------------------------------|------------------------|----|------|----|----|----------|---|
| J-J16TP230  | D.60 JET                             | 30                     | 22 | 25,3 | 25 | 53 | J00TP201 | - |
| J-J16TP270  | D.60 JET                             | 70                     | 22 | 25,3 | 25 | 53 | J00TP206 | - |
| J-J00TP200  | FROM D.76 JET TO D.90 JET<br>D.90 C2 | 30                     | 25 | 32,3 | 34 | 63 | J00TP201 | - |
| J-J00TP270  | FROM D.76 JET TO D.90 JET<br>D.90 C2 | 70                     | 25 | 32,3 | 34 | 63 | J00TP206 | - |
| J-J00TP210  | FROM D.76 JET TO D.90 JET<br>D.90 C2 | 100                    | 25 | 32,3 | 34 | 63 | J00TP207 | - |
| J-J01TP270  | D.114 JET - D.114 C2                 | 70                     | 30 | 40   | 34 | 71 | J00TP206 | - |
| J-J01TP210  | D.114 JET - D.114 C2                 | 100                    | 30 | 40   | 34 | 71 | J00TP207 | - |
| J-J01TP212  | D.114 JET - D.114 C2                 | 120                    | 30 | 40   | 34 | 71 | J00TP212 | - |



| CODICE CODE | SYSTEM                          | CLOSING PRESSURE (BAR) | A  | B  | C  | D  | E        | F     |
|-------------|---------------------------------|------------------------|----|----|----|----|----------|-------|
| J-J01TPC70  | STRAJET                         | 70                     | 30 | 42 | 31 | 58 | J00TP206 | OR220 |
| J-J01TPC00  | STRAJET                         | 100                    | 30 | 42 | 31 | 58 | J00TP207 | OR220 |
| J-J01TPC12  | STRAJET                         | 120                    | 30 | 42 | 31 | 58 | J00TP212 | OR220 |
| J-J02TP270  | D.127 JET<br>D.127 C2- D.140 C2 | 70                     | 40 | 50 | 34 | 71 | J00TP206 | -     |
| J-J02TP210  | D.127 JET<br>D.127 C2- D.140 C2 | 100                    | 40 | 50 | 34 | 71 | J00TP207 | -     |
| J-J02TP212  | D.127 JET<br>D.127 C2- D.140 C2 | 120                    | 40 | 50 | 34 | 71 | J00TP212 | -     |



| CODICE CODE | SYSTEM   | CLOSING PRESSURE (BAR) | A  | B    | C    | D  | E        | F     |
|-------------|----------|------------------------|----|------|------|----|----------|-------|
| J-J00NTPC70 | STRAJET  | 70                     | 30 | 42   | 31   | 79 | D-1970-3 | OR220 |
| J-J00NTPC00 | STRAJET  | 120                    | 30 | 42   | 31   | 79 | D-1970-5 | OR220 |
| J-J00TCA30  | D.90 C2  | 30                     | 25 | 32,3 | 34   | 63 | J00TP201 | -     |
| J-J00TCA70  | D.90 C2  | 70                     | 25 | 32,3 | 34   | 63 | J00TP206 | -     |
| J-J00TCA00  | D.90 C2  | 100                    | 25 | 32,3 | 34   | 63 | J00TP207 | -     |
| J-J01TCA70  | D.114 C2 | 70                     | 30 | 40   | 28,5 | 58 | J00TP206 | -     |
| J-J01TCA00  | D.114 C2 | 120                    | 30 | 40   | 28,5 | 58 | J00TP212 | -     |

## NOTES



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Certificato N° IT00/0007