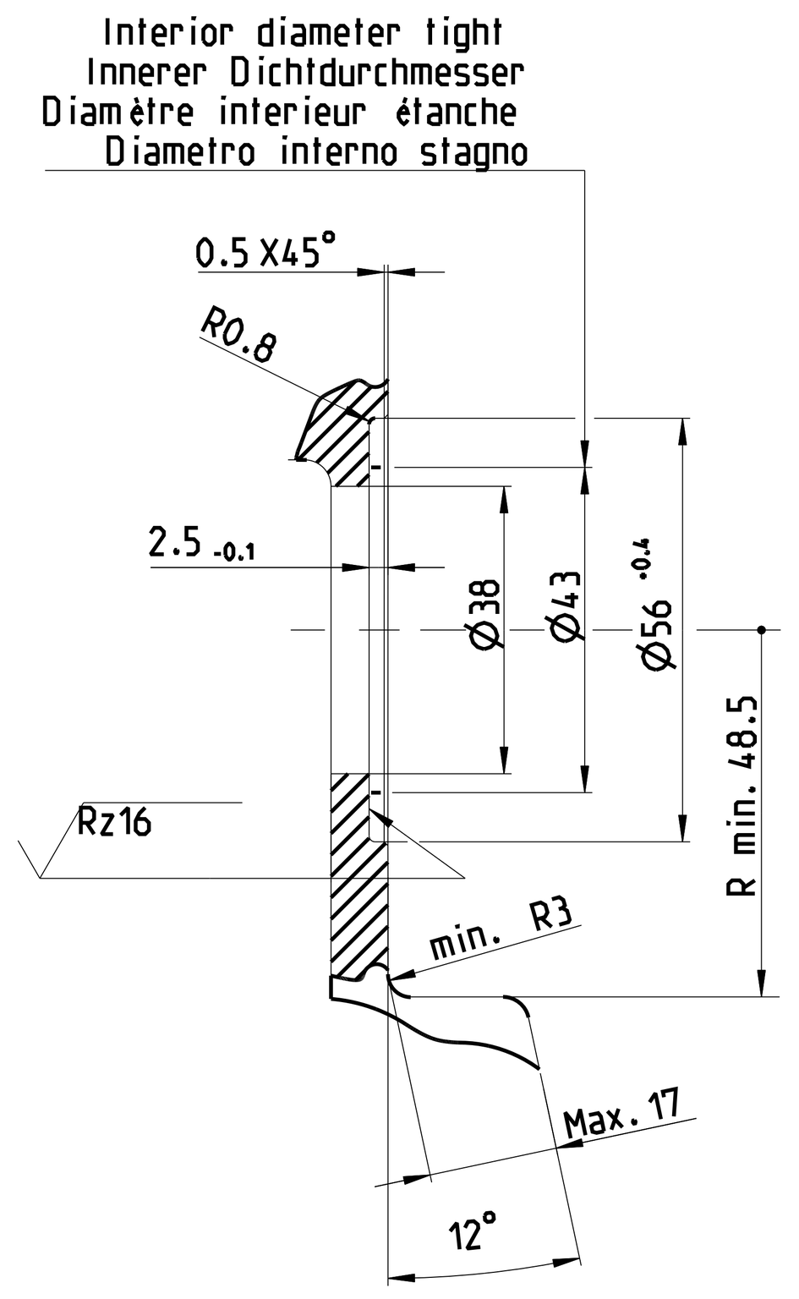
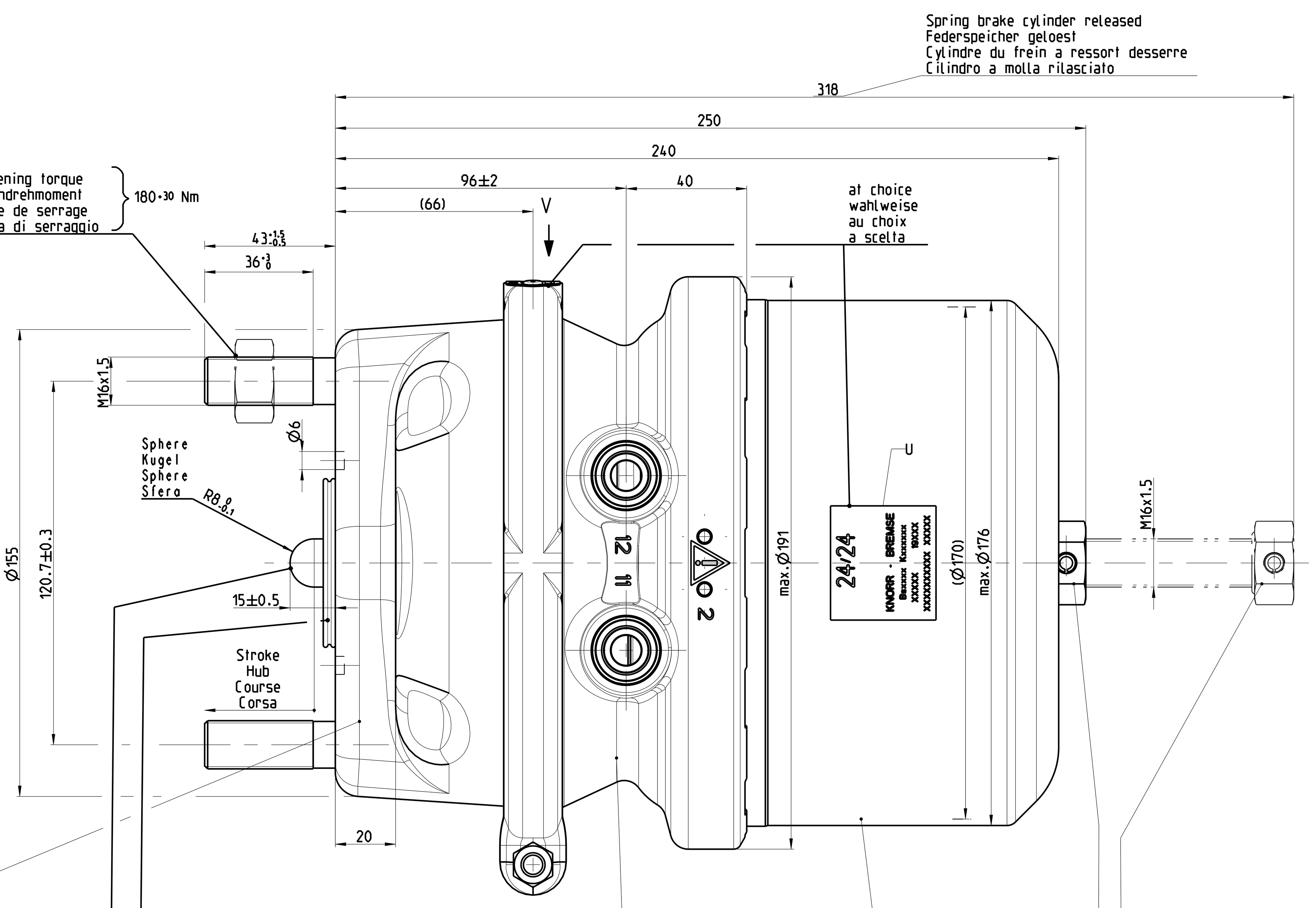
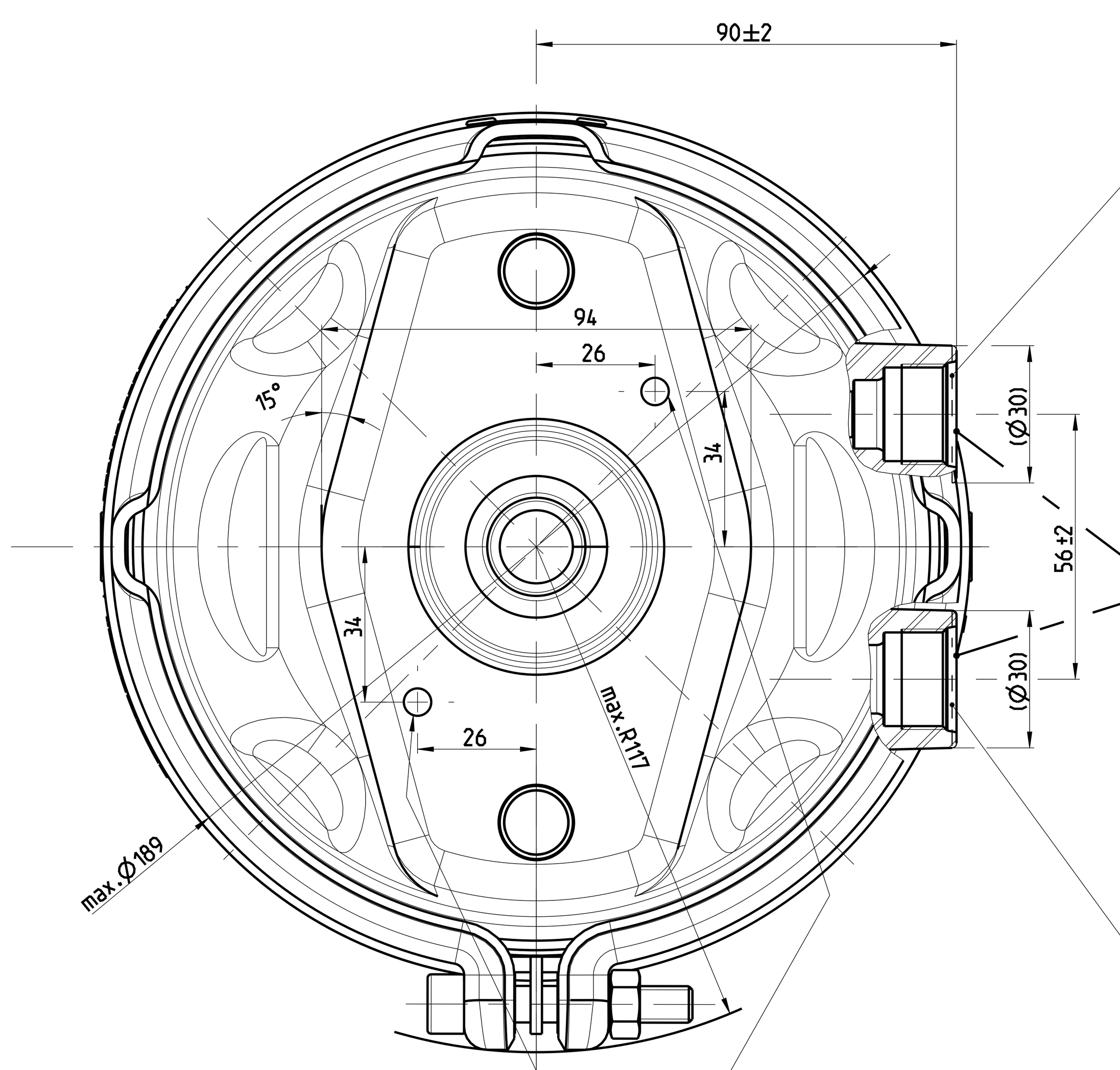
Tolerances/Toleranzen/Tolérances/Tolleranze							
Nominal dimensions in / Nominalmasse in / Cotes nominales en / Dimensioni nominali in: mm							
<6	>6 ≤30	>30 ≤80	>80 ≤120	>120 ≤315	>315	∠	
±1	±1.5	±2	±2.5	±3	±4	±3°	

- General presentation, exact orientation of the components, see below.
- Allgemeine Darstellung, fuer genaue Teileorientierung; siehe Ansicht unten.
- Présentation générale, orientation exacte des pièces, voir vue en bas.
- Presentazione generale. Per l'orientazione corretta dei pezzi, vedere il disegno sotto.



Installation dimension of brake caliper
Anschlssgeometrie des Bremssattels
Bride de fixation de l'étrier de frein
Geometria della flangia sulla staffa





12 Spring-loaded cylinder / Federspeicherzylinder / Cylindre à ressort / Cilindro a molla

Tightening torque for VOSS connector 230 and VOSS 232 / Anziehdrehmoment fuer VOSS steckystem 230 und VOSS 232 / Couple de serrage pour raccord VOSS 230 et VOSS 232 / Coppia di serraggio per raccordo VOSS 230 e VOSS 232 — 14 +3 Nm

Tightening torque for plug connector M22x1.5 / Anziehdrehmoment fuer steckverbindung M22x1.5 / Couple de serrage pour raccord M22x1.5 / Coppia di serraggio per raccordo M22x1.2 — max.60Nm

Ports for plug connector / Anschluesse fuer Steckverbindung / Orifices pour raccord rapide / Orifici per raccordo rapido — M22x1.5 N10164 - NG12

11 Service brake / Betriebsbremse / Frein de service / Freno di servizio

11 Charging and venting of spring portion via connection 11 / Be- und Entlueftung des Federraumes ueber Anschluss 11 / Alimentation et mise a l'atmosphere de la chambre a ressort par le raccord 11 / Alimentazione ed evacuazione della attraverso attacco 11

2 breather holes not closed / 2 Atmungsbohrungen nicht verschlossen / 2 trous de respiration non fermés / 2 fori di respirazione non chiuso

Max. releasing torque / Max. Loesemoment / Couple de desserrage max. / Coppia di rilascio max. — 35Nm

Mechanical releasing device: Spanner width / Mechanische Loesevorrichtung: SW / Dispositif de desserrage mécanique: Cote sur plats / Dispositivo di rilascio meccano.Chiave — 24

Tightening torque in operating position / Anziehdrehmoment in Betriebsstellung / Couple de serrage en position de service / Coppia di serraggio nella posizione di servizio — 20 - 70 Nm

Sealing:pressure tight against secondary chamber / Abdichtung:druckdicht zum Sekundaerraum / Etancheite: etanche a la chambre secondaire / Tenuta ermetizare la camera secondaria — 0.4 bar

yellow chromated / anodizing / gelbchromatiert / anodisiert / chromaté jaune / anodisé / chromatato giallo / anodizzazione

Aluminium, raw / Aluminium, unbehandelt / Aluminium, brut / Aluminio, greggio

Max.pivoting angle of piston rod in all directions / Schwenkbereich der Kolbenstange allseitig max. / Angle de pivotement max. de la tige de piston de tous cotes / Angolo di rotazione dello stelo stantuffo in tutti i direzioni — 4°

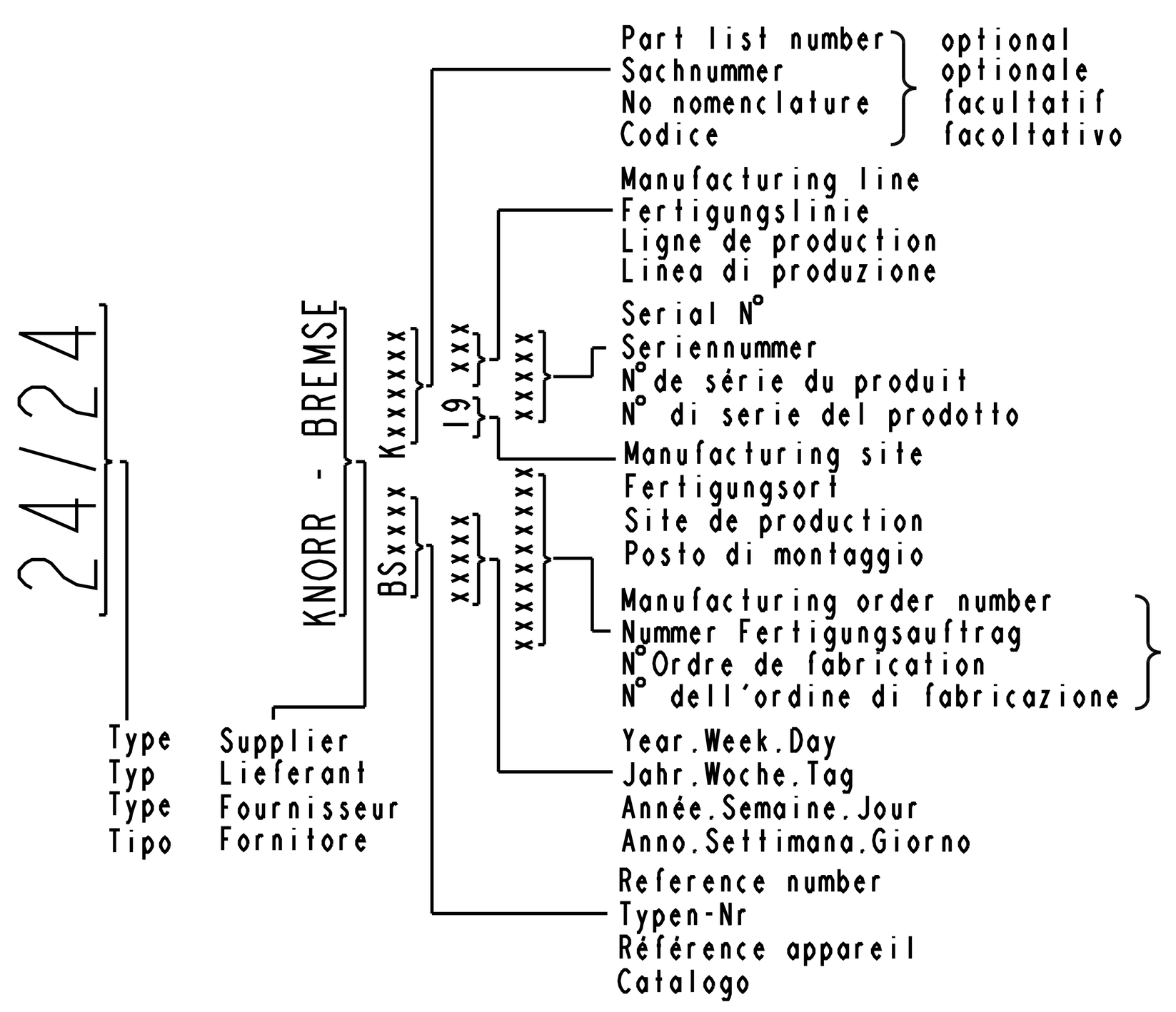
At choice:
Non pressure plate powder - coated except the studs phosphated, preserved
or
Non pressure plate Zinc

Wahlweise:
Zylinderdeckel pulverbeschichtet mit Ausnahme der Stehbolzen phosphatiert konserviert
oder
Zylinderdeckel Verzinkte Beschichtung

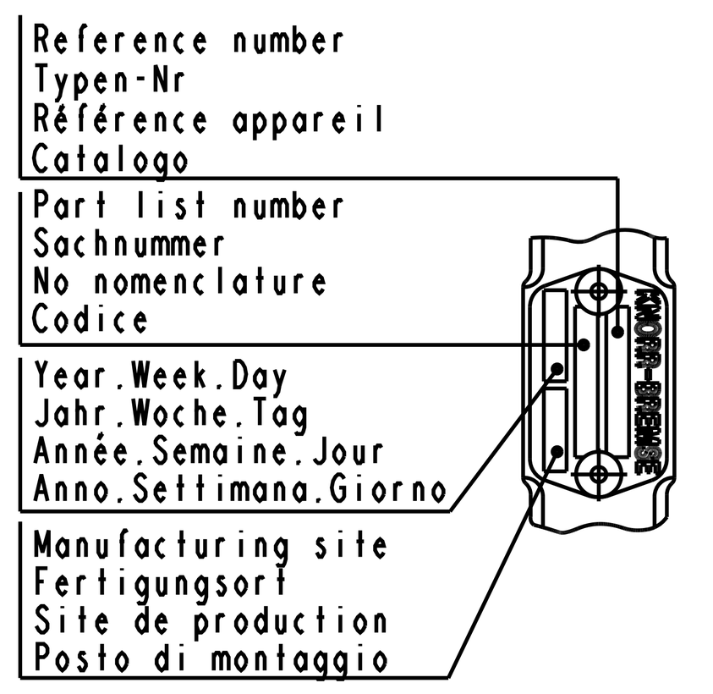
Au choix:
Corps avant enrobé de poudre sauf les goujons phosphatés conserves
ou
Corps avant Zingué

A scelta:
Corpo anteriore rivestito con polvere trane le viti con fosfatazione conservata
o
Corpo anteriore Zincato

U
2/1



V



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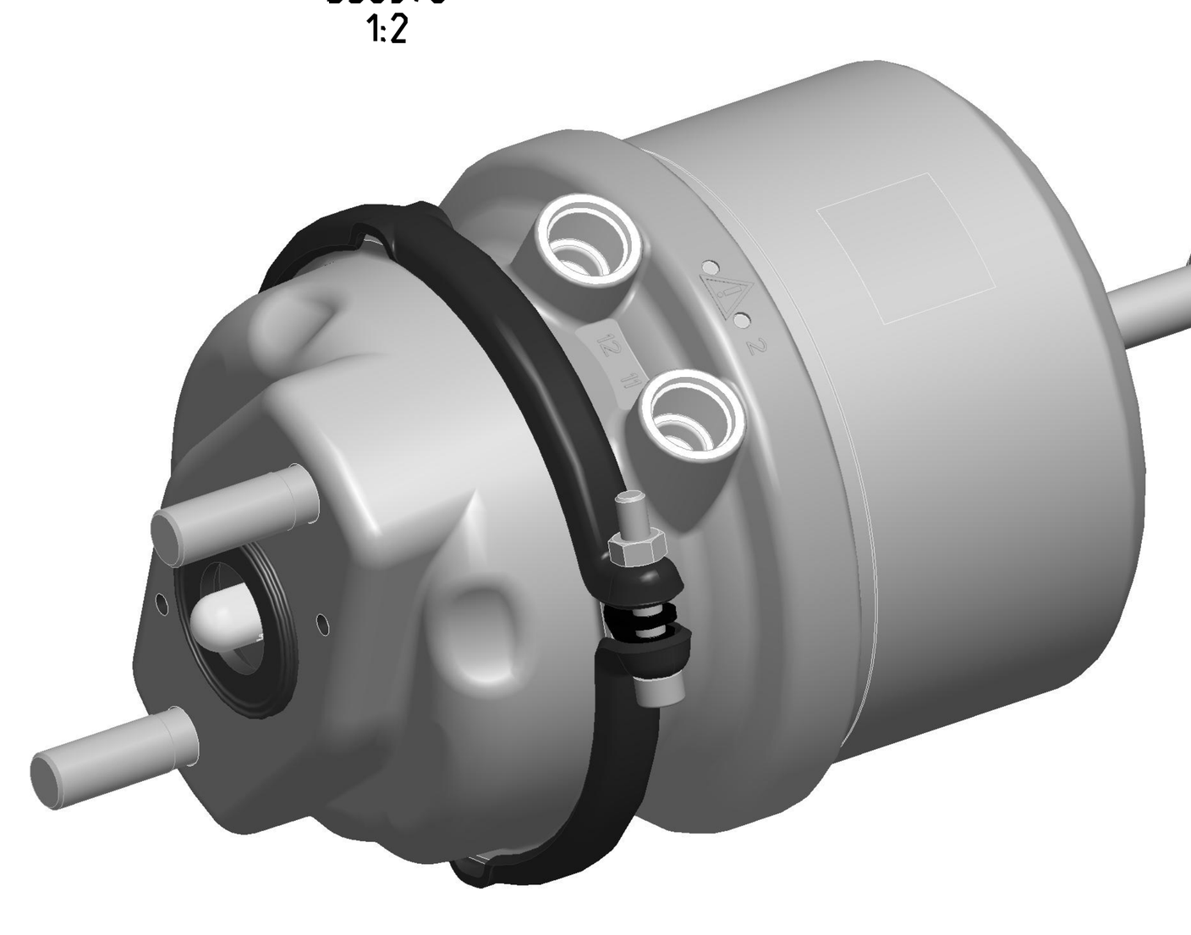
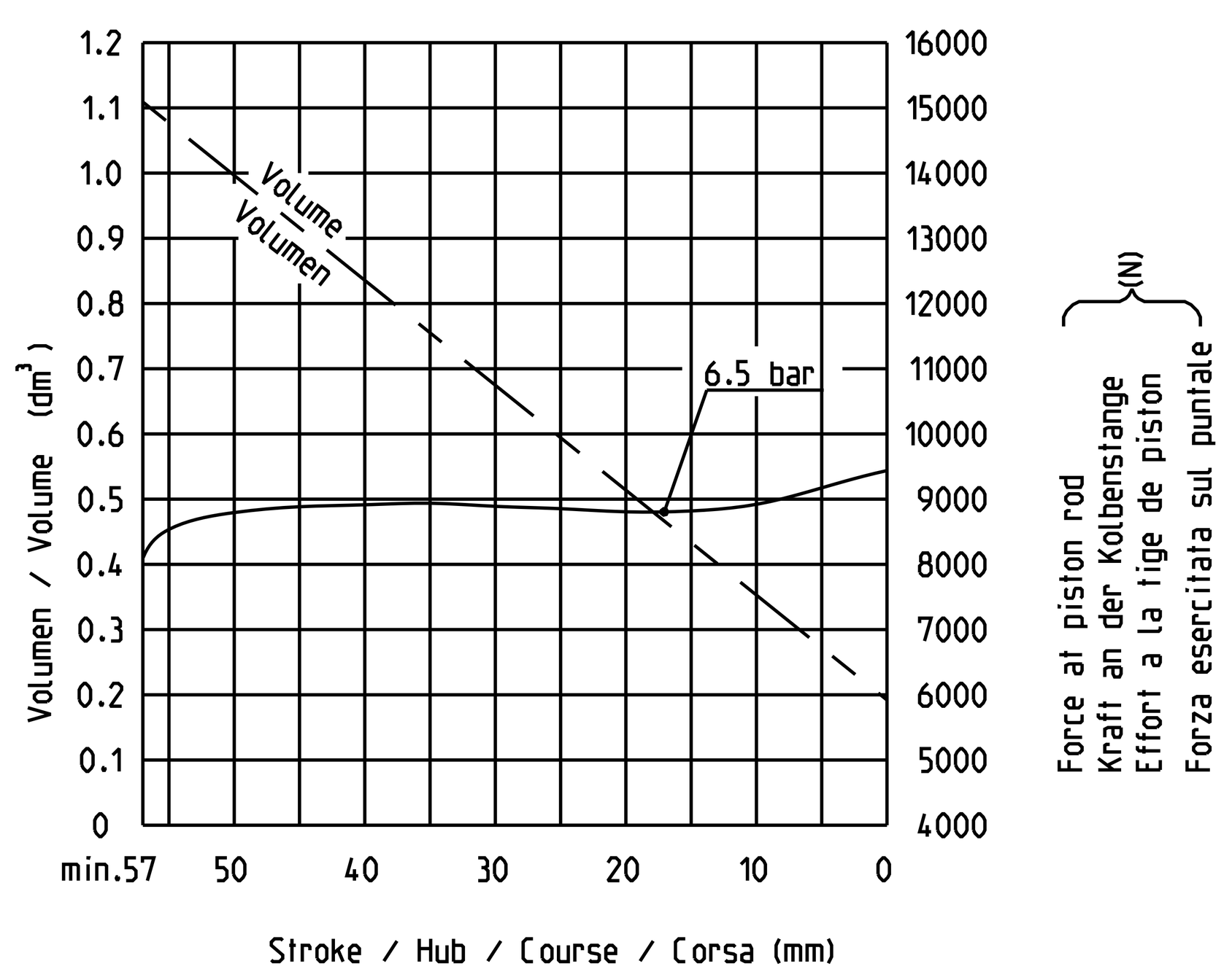


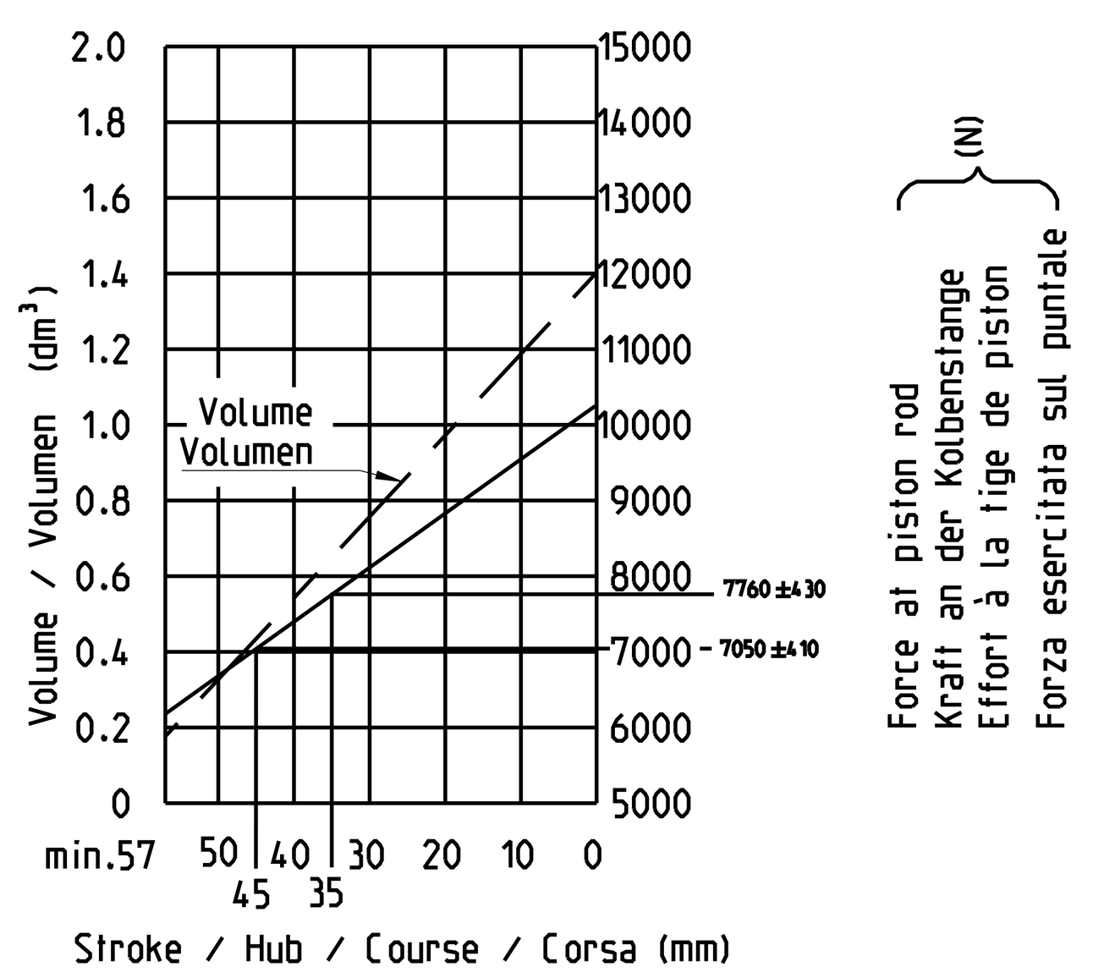
Force of return spring at stroke 20 mm / Kraftabgabe der Rueckholfeder bei Hub 20 mm / Force du ressort de rappel à une course de 20 mm / Forza della molla di ritorno a una corsa di 20 mm — F = 200 N

Diagram of service brake / Diagramm der Betriebsbremse / Diagramme du frein de service / Diagramma del freno di servizio — Type 24



Required release pressure / Erforderlicher Loesedruck / Pression de desserrage nécessaire / Pressione di rilascio necessaria — 5.1± 0.3 bar

Diagram of spring loaded cylinder / Diagramm des Federspeichers / Diagramme du cylindre à ressort / Diagramma del cilindro a molla — Type 24



Operational uses specifications:

Max. operating pressure / Max. Betriebsdruck / Pression de service max. / Pressione d'esercizio max. — 11 — 10.2 bar

Max. operating pressure / Max. Betriebsdruck / Pression de service max. / Pressione d'esercizio max. — 12 — 8.5 bar

Permissible leakage / Zulaessige Undichtheit / Fuite admissible / Fuga d'aria ammissibile — $V_n = 10\ cm^3/min$

Critical uses specifications without part failure:

Max. pressure / Hoechstdruck / Pression max. / Pressione massima — 11 — 13 bar

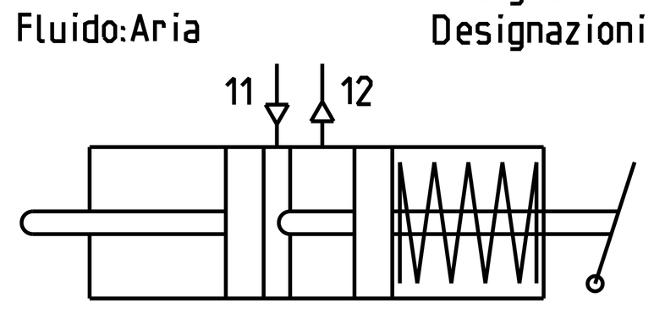
Max. pressure / Hoechstdruck / Pression max. / Pressione massima — 12 — 11 bar

Temperature range / Therm. Anwendungsbereich / Plage de température / Campo termico di applicazione — -40°C bis / to / à / a +80°C

General specifications:

Medium: Air / Medium: Luft / Fluide:Air / Fluido:Aria

Designation of connection threads corresponding to / Anschlussbezeichnungen nach / Désignations des raccords selon / Designazioni degli attachi secondo — DIN-ISO 6786



Graphic symbol / Schaltzeichen / Symbole graphique / Simbolo grafico — DIN-ISO 1219

Specifications for service brake actuation in parking position:

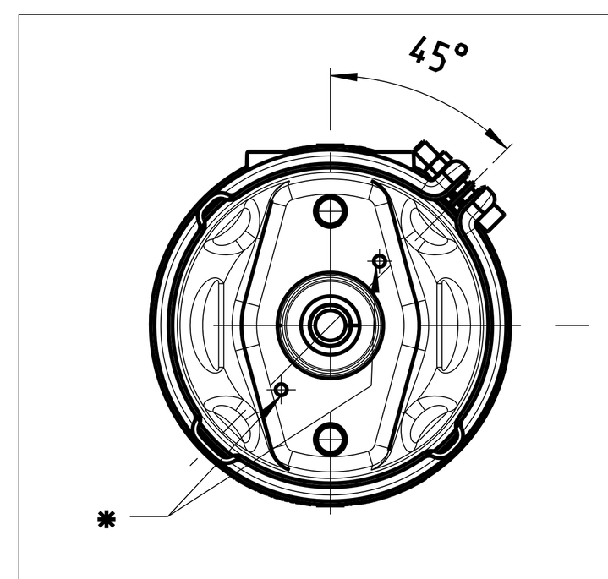
Minimum pressure / Minimum Druck / Pression minimale / Pressione minimo — 11 — 2 bar

Pressure rising min. / Druckgradient min. / Montee en pression min. / Aumento della pressione min. — 11 — 3 bar/s

- Exhaust hole must be directed downwards when monted
- Entlueftung muss im eingebauten Zustand nach unten zeigen
- L'orifice d'échappement doit etre dirigé vers le bas en état monté
- Installato il foro di scarico dovra essere rivolto verso il basso

- Breather holes opened
- Atmungsbohrungen geoeffnet
- Trous de respiration ouverts
- Fori di respirazione aperti

— Ø6



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KB-Ref.number / KB-Bestell-Nr. / KB-No de réf. / Codice KB per ordince	ZF - ref. no. / ZF - Nr / ZF - No. de ref. / ZF - Codice	Weight / Gewicht / Masse / Massa (kg)

Type 24/24

Spring Brake (Disc) / Kombizylinder (Scheibe) / Cyl. frein double (disque) / Bielemento fren. (disco)

KNORR-BREMSE — Systèmes pour Véhicules Utilitaires France S.A. — Knorr-Bremse Group

Drawing Number: Z059435 — 000