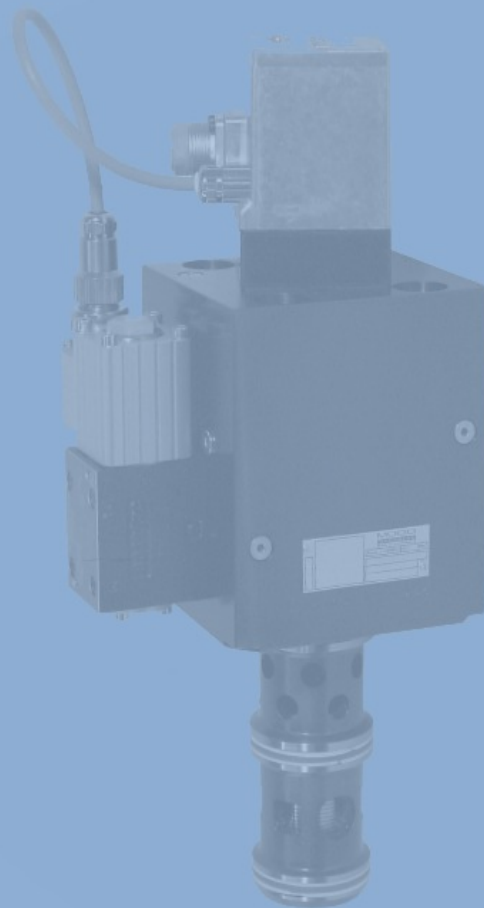


# 3-WAY SERVO CARTRIDGE VALVE

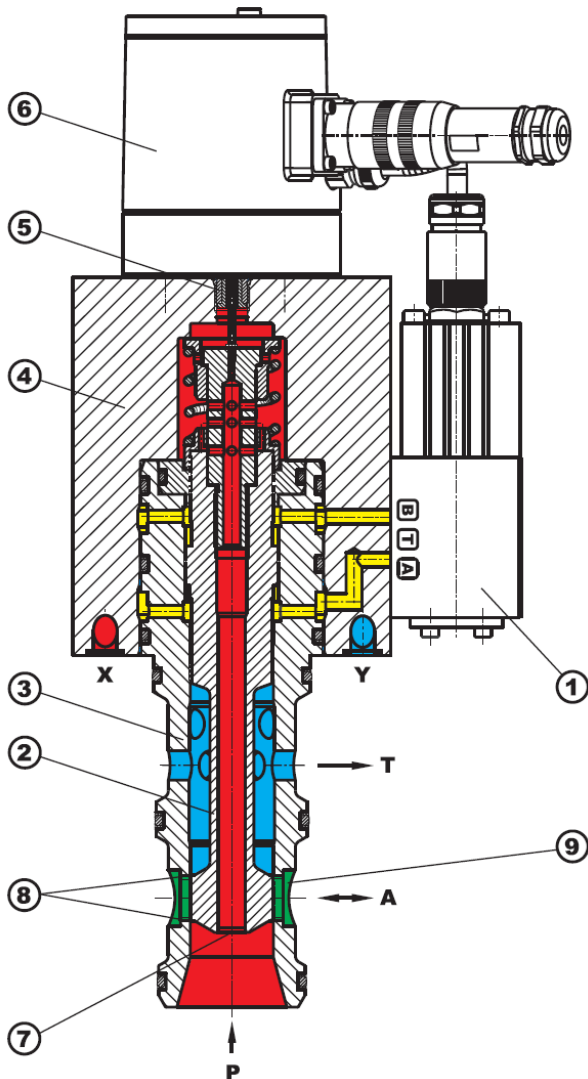
SIZES 30, 50, 63  
SE3 series



REV. B, 04/2017

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Specifications	3
Block circuit diagram of the integrated control electronics	4
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This catalogue is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has to check the suitability of the products described herein. If in doubt, please contact Moog.



## Servo valve for manifold mounting

Continuously adjustable flow from P to A or A to T;  
Pilot valve (1) located directly on the cover (4).

## Technical design

The valve comprises of 6 main groups:

- Pilot valve (1)
- Main stage spool (2)
- Sleeve (3)
- Cover (4)
- Position transducer (5)
- Integrated control electronics (6)

## Function description

- Main stage spool (2) with equal pilot-surfaces.
- Controlled by a high-dynamic proportional-pilot valve (D633).
- Pressure balance through the drilling (7) in the main stage spool (2), resulting in a very low displacement force.
- Control of the main flow from P to A or A to T by the spool lands (8).
- Control of the main stage spool by a position transducer (5).
- Closed loop by integrated electronics (6).
- Failsafe features: => Fail-safe sandwich plate or biased pilot valve, see on page 13.

**Recommendation:** For application where vibrations shocks higher than 30g are expected, the electronics with additional dampening elements are required. (see "ES" in the Ordering Information)

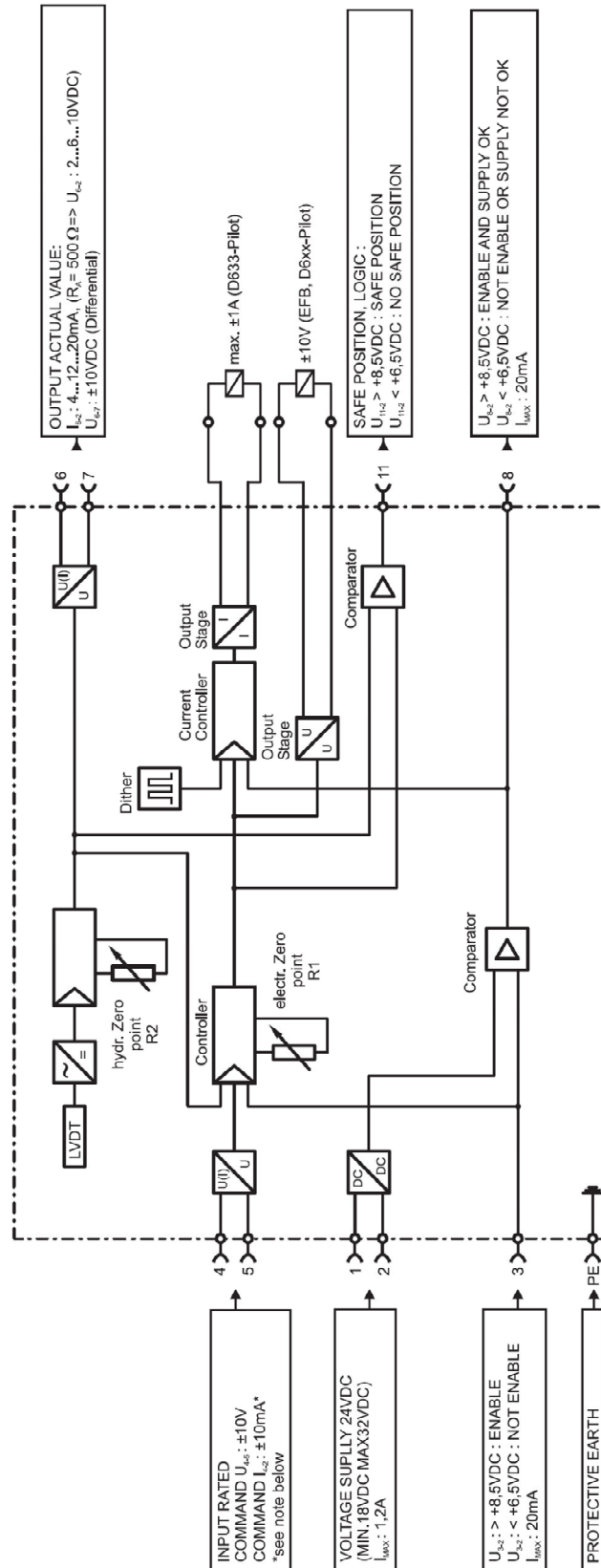
**Attention:** Wrong connecting leads to uncontrolled movements of the main stage spool and may cause damage to person and machine!

<b>General Technical Data</b>			
Valve type	3/3-way cartridge valve, sliding spool valve with position control and integrated electronics, proportional-hydraulically operated.		
Mounting orientation	Any (for best results avoid mounting along vibration axis)		
Vibration (g)	30 (3 axes)		
Ambient temperature range (°C)	-20 to +60		
<b>Weight</b>	<b>Size 30</b>	<b>Size 50</b>	<b>Size 63</b>
Basic, without fail-safe sandwich plates (kg)	18	28	44
With fail-safe sandwich plate (kg)	21	31	47
<b>Hydraulic Data</b>			
Max. operating pressure (bar) main stage, ports P, A & T	210 (350 on request, special cavity required)		
Max. operating pressure (bar) pilot stage	350		
Temperature range of hydraulic fluid (°C)	-20 to +80		
Viscosity range – recommended (mm <sup>2</sup> /s; cSt)	15 to 45		
Viscosity range – max allowable (mm <sup>2</sup> /s; cSt)	5 to 400		
<b>Filtration of pilot stage</b>	<b>D633 pilot valve</b>		
Recommended cleanliness class for functional safety	< 18/15/12 (ISO 4406)		
Recommended cleanliness class for longer service life	< 17/14/11 (ISO 4406)		
<b>Filtration of main stage</b>			
Recommended cleanliness class for functional safety	< 20/18/15 (ISO 4406)		
Recommended cleanliness class for longer service life	< 17/14/11 (ISO 4406)		
<b>Performance</b>	<b>Size 30</b>	<b>Size 50</b>	<b>Size 63</b>
Nominal flow at $\Delta p=5 \text{ bar}^1$ (l/min)	425	850	1185
Maximum permissible flow (l/min)	900	1800	2500
Stroke of main stage spool from center (mm)	±8	±8	±10
Spool displacement at full stroke (cm <sup>3</sup> )	1,2	3,3	4,8
Nominal flow of pilot at $\Delta p=35 \text{ bar}^1$ (l/min)	7,5	10	20
Max leakage of pilot when centered, $\Delta p_x=180 \text{ bar}$ (l/min)	0,4		
<b>Static / Dynamic</b>			
Hysteresis (%)	< 0,2		
Response time 100% Signal change at $p_x=180 \text{ bar}$ (ms)	13	18	25

<sup>1)</sup> Nominal flow per land / to calculate flow rate at a different  $\Delta p$ :  $Q_x = Q_N * \sqrt{\frac{\Delta p_x}{5}}$

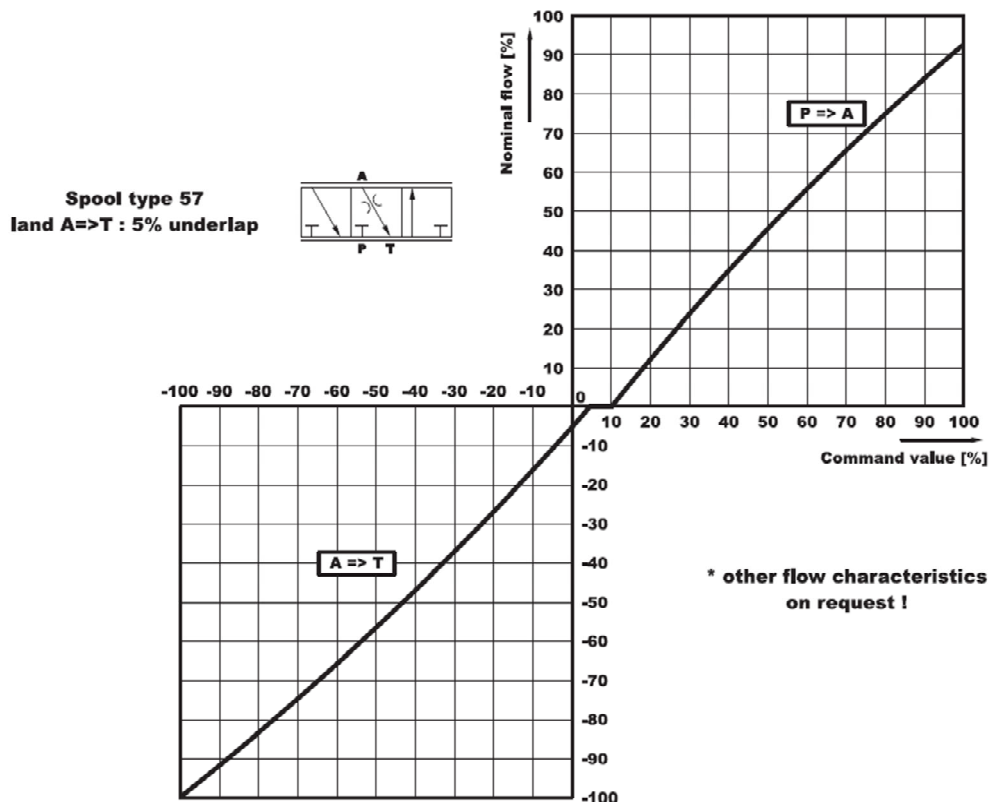
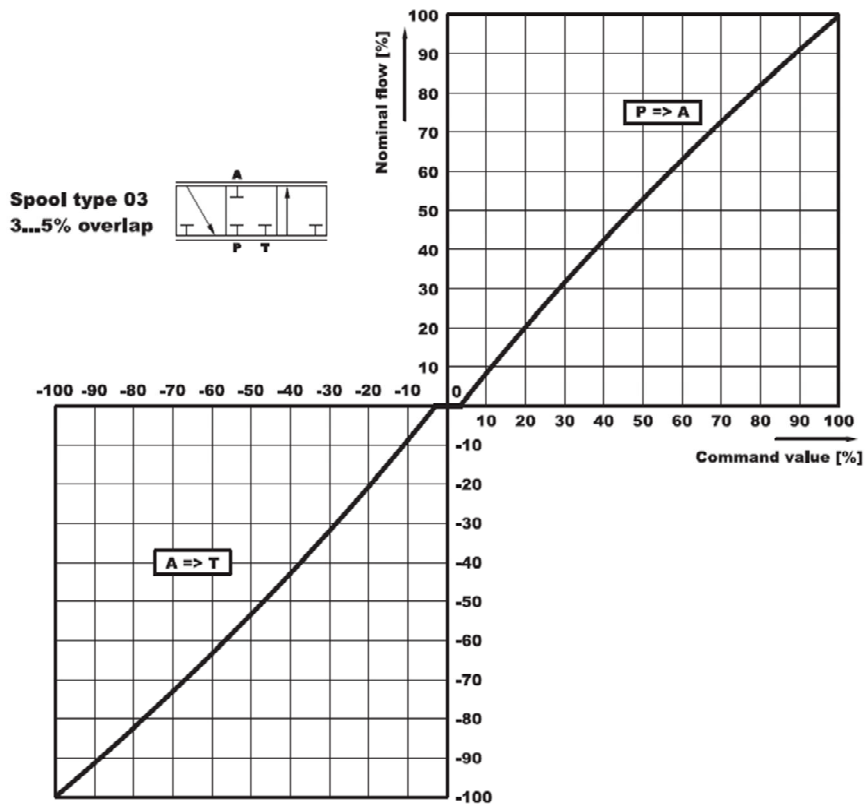
# BLOCK CIRCUIT DIAGRAM OF THE INTEGRATED CONTROL ELECTRONICS

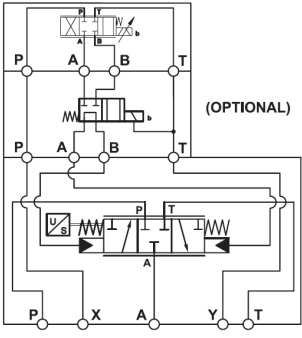
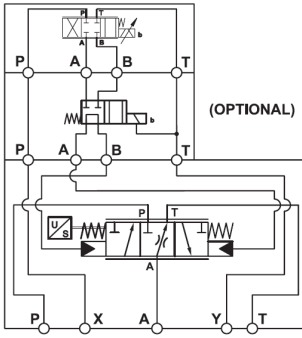
Pole connector to EN 175201 Part 804 (DIN 43 651), and mating connector (type E, metal shell) with leading protective earth connection ( $\equiv$ )

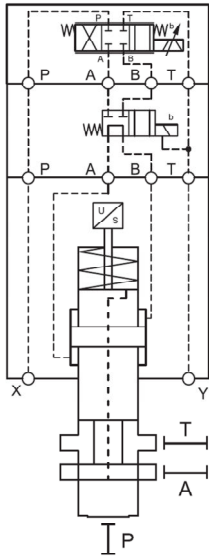


\*INPUT RATED COMMAND  $\pm 10 mA$ .  
 The stroke of the spool is proportional to  $I_c = -I_c$ .  
 100% spool opening  $P \Rightarrow A$ , or  $A \Rightarrow T$  is achieved at  $I_c = \pm 10mA$ .  
 If pin 4 is used, pin 5 must be connected to pin 2 at cabinet side.  
 At 0 mA command signal the spool is in center position.

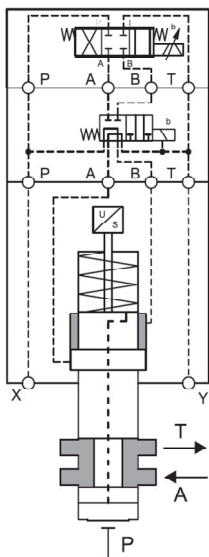
## Flow characteristics + Spool types\*



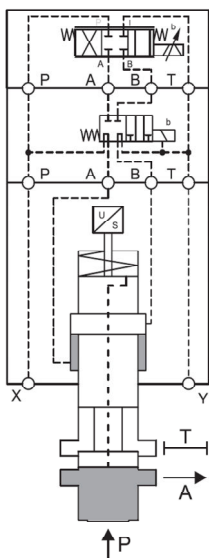
Symbol	Size	Q <sub>N</sub> (l/min) at Δp=5 bar	Ordering Code	Weight (kg)
 <p>Spool 03</p>	30	425	SE3E30D1A03A_2_A_X0A	Basic: 18 w/ failsafe: 21
	50	850	SE3E50D1A03A_2_B_X0A	Basic: 28 w/ failsafe: 31
	63	1185	SE3E63F1A03A_2_C_X0A	Basic: 44 w/ failsafe: 47
 <p>Spool 57</p>	30	425	SE3E30D1A57A_2_A_X0A	Basic: 18 w/ failsafe: 21
	50	850	SE3E50D1A57A_2_B_X0A	Basic: 28 w/ failsafe: 31
	63	1185	SE3E63F1A57A_2_C_X0A	Basic: 44 w/ failsafe: 47



**Fail-safe function**  
**A & M**

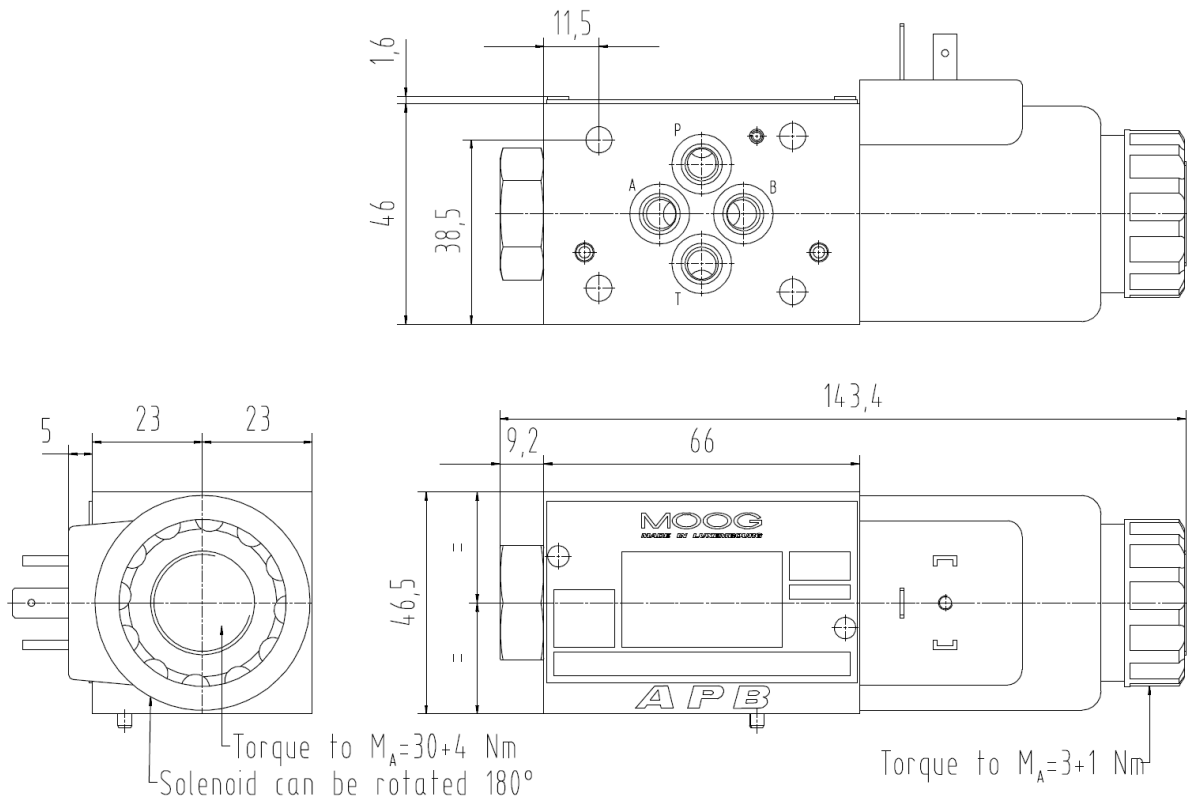


**Fail-safe function**  
**F**

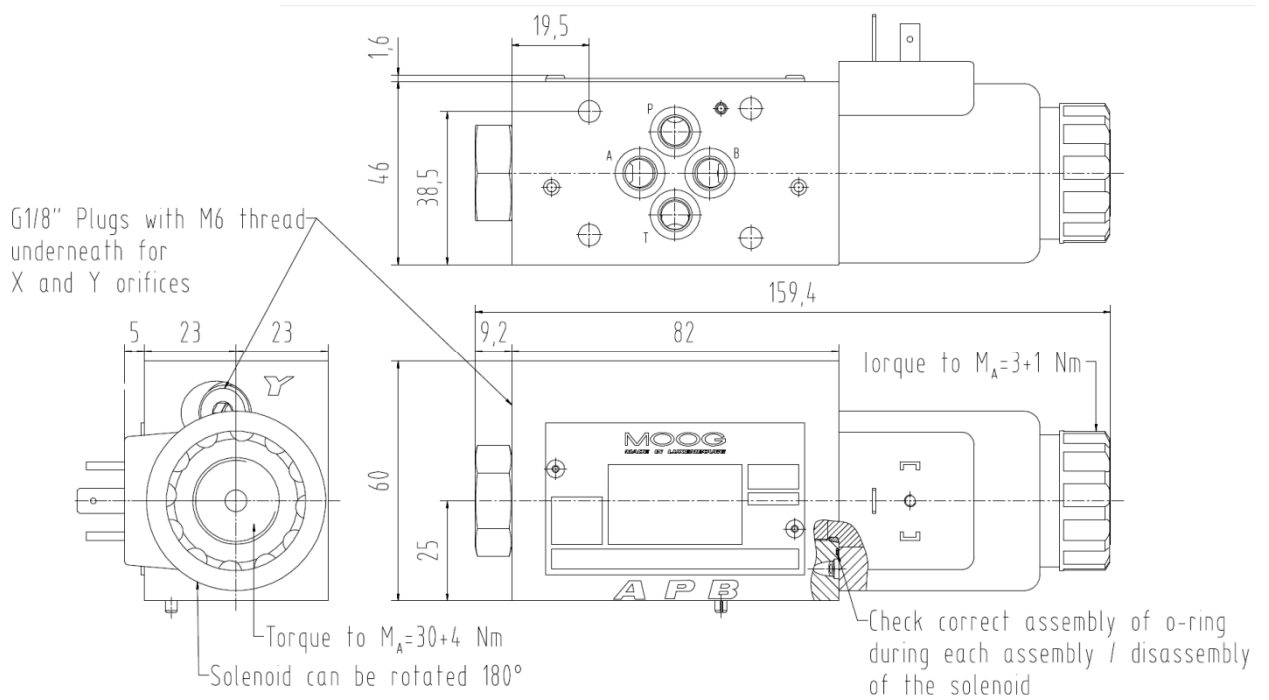


**Fail-safe function**  
**H**



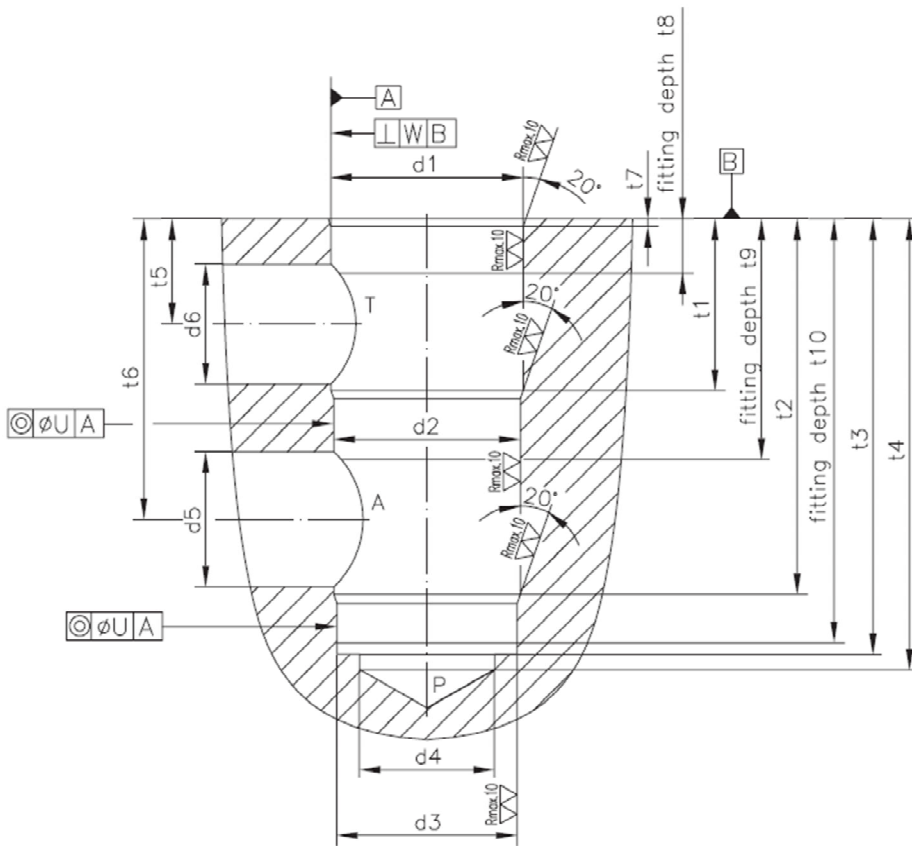
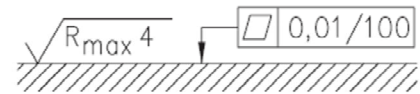


**4/2 Fail-safe sandwich plate (A & M)**

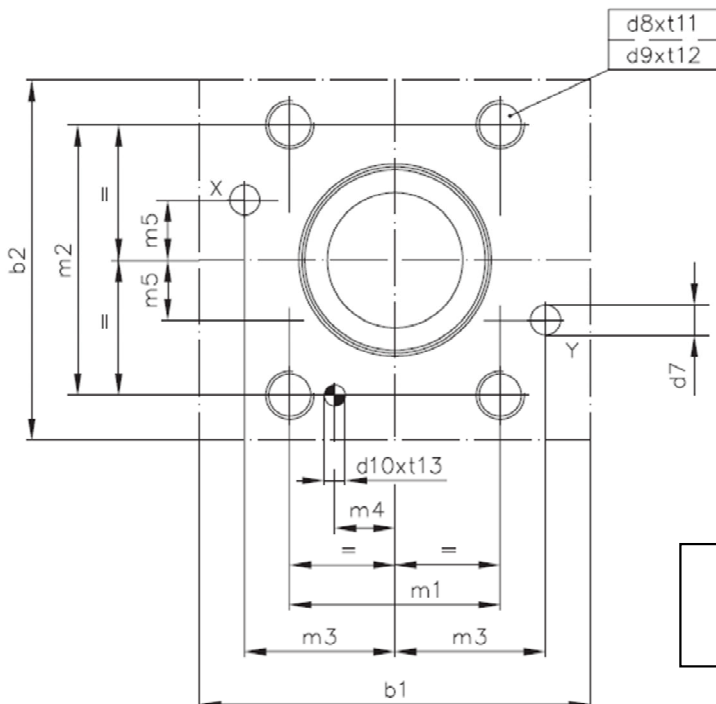


**6/2 Fail-safe sandwich plate (F & H)**

Required surface finish



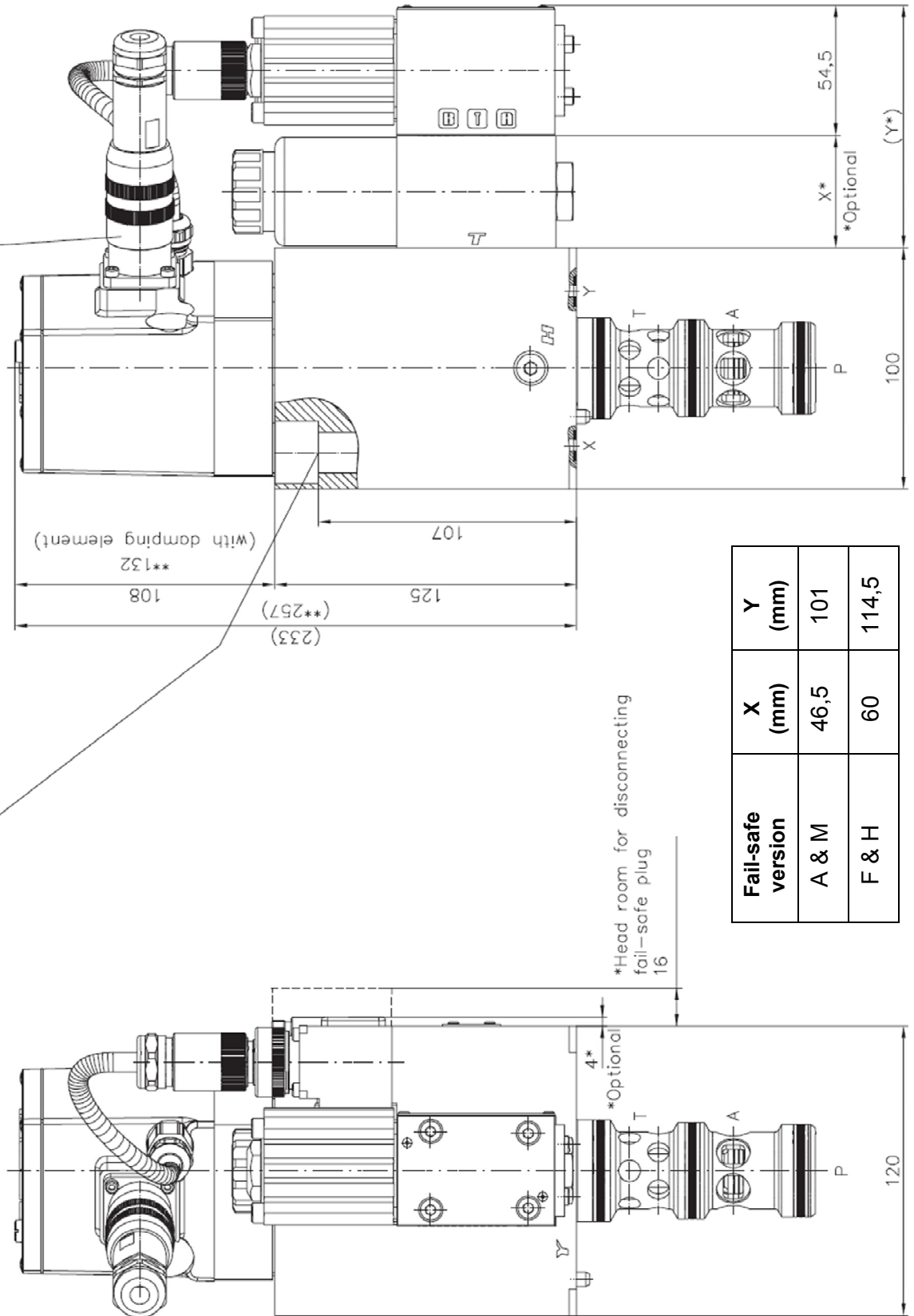
Dimension	NB30	NB50	NB63
b1	100	130	160
b2	120	120	140
d1 <sup>H7</sup>	42	64	92
d2 <sup>H7</sup>	40	62	90
d3 <sup>H7</sup>	38,1	60	88
d4 <sup>max.</sup>	30	45	63
d5 <sup>max.</sup>	30	45	63
d6 <sup>max.</sup>	25	40	55
d7 <sup>max.</sup>	6.	10	10
d8	14	14	17,5
d9	M16	M16	M20
d10 <sup>H13</sup>	7	7	8
m1 ±0,2	70	70	100
m2 ±0,2	90	90	100
m3 ±0,2	32	50	65
m4 ±0,2	20	20	70
m5 ±0,2	11	20	15
t1 +0,1	40	57	77,5
t2 +0,1	85	125	158,5
t3 +0,5	100	145	178
t4 <sup>min.</sup>	105	150	183
t5	26	35	48
t6	68	100	126
t7	2,5	2,5	2,5
t8	18	18	20
t9	58	80	96
t10	98	141	175
t11	31	31	38
t12	26	26	33
t13	8	8	10
U	0,05	0,05	0,05
W	0,05	0,05	0,05



Cavity suitable for  
210 bar operating pressures  
(350 bar cavity available on request)

11+PE-pole mating connector to EN 175201 Part 804 (DIN 43 651)  
for EMC-reasons => metal shell  
not included in delivery.

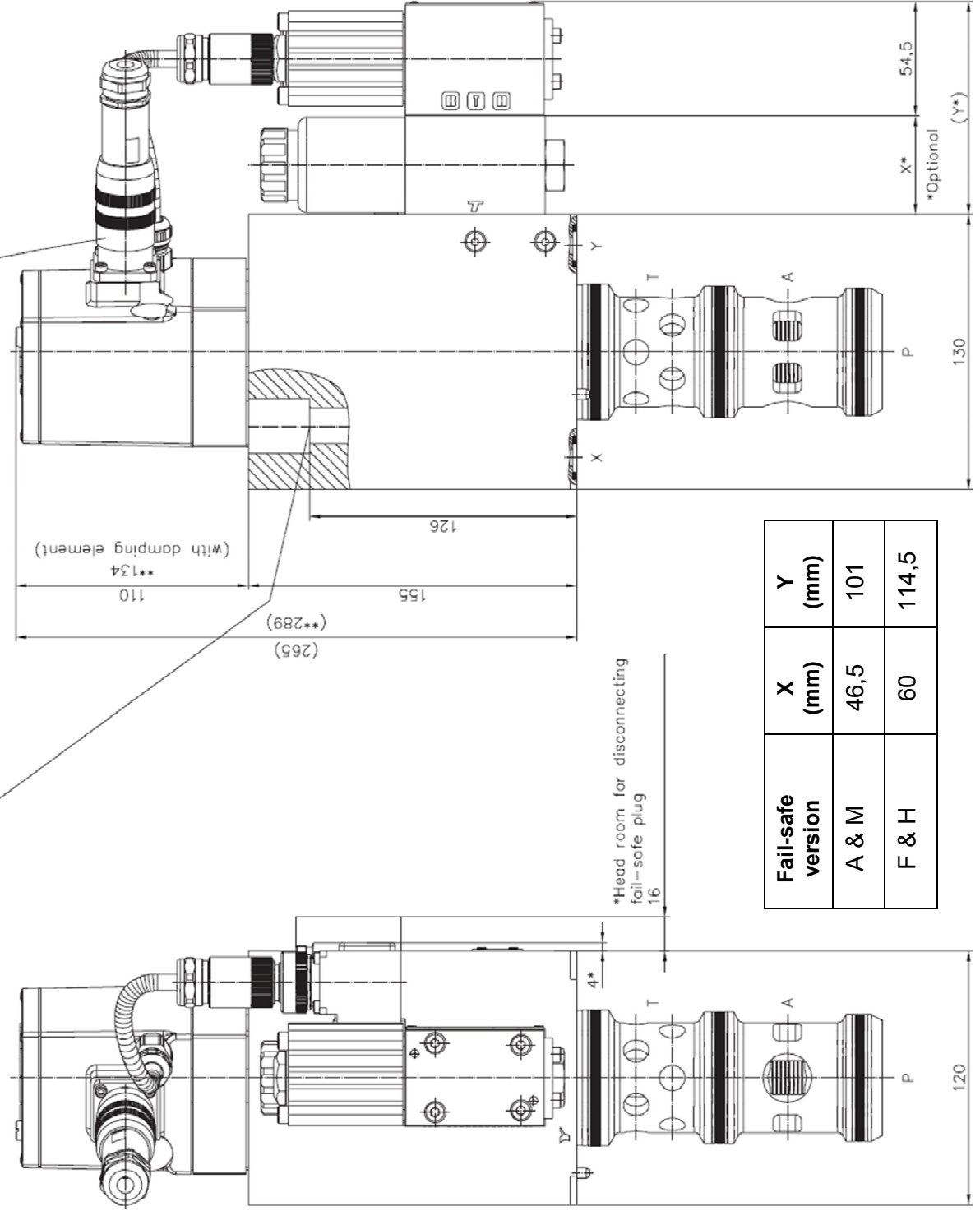
Screws ISO 4762-M16x130-12.9  
not included in delivery.  
Tightening torque:  $M_A = 300 \text{ Nm}$



Fail-safe version	X (mm)	Y (mm)
A & M	46,5	101
F & H	60	114,5

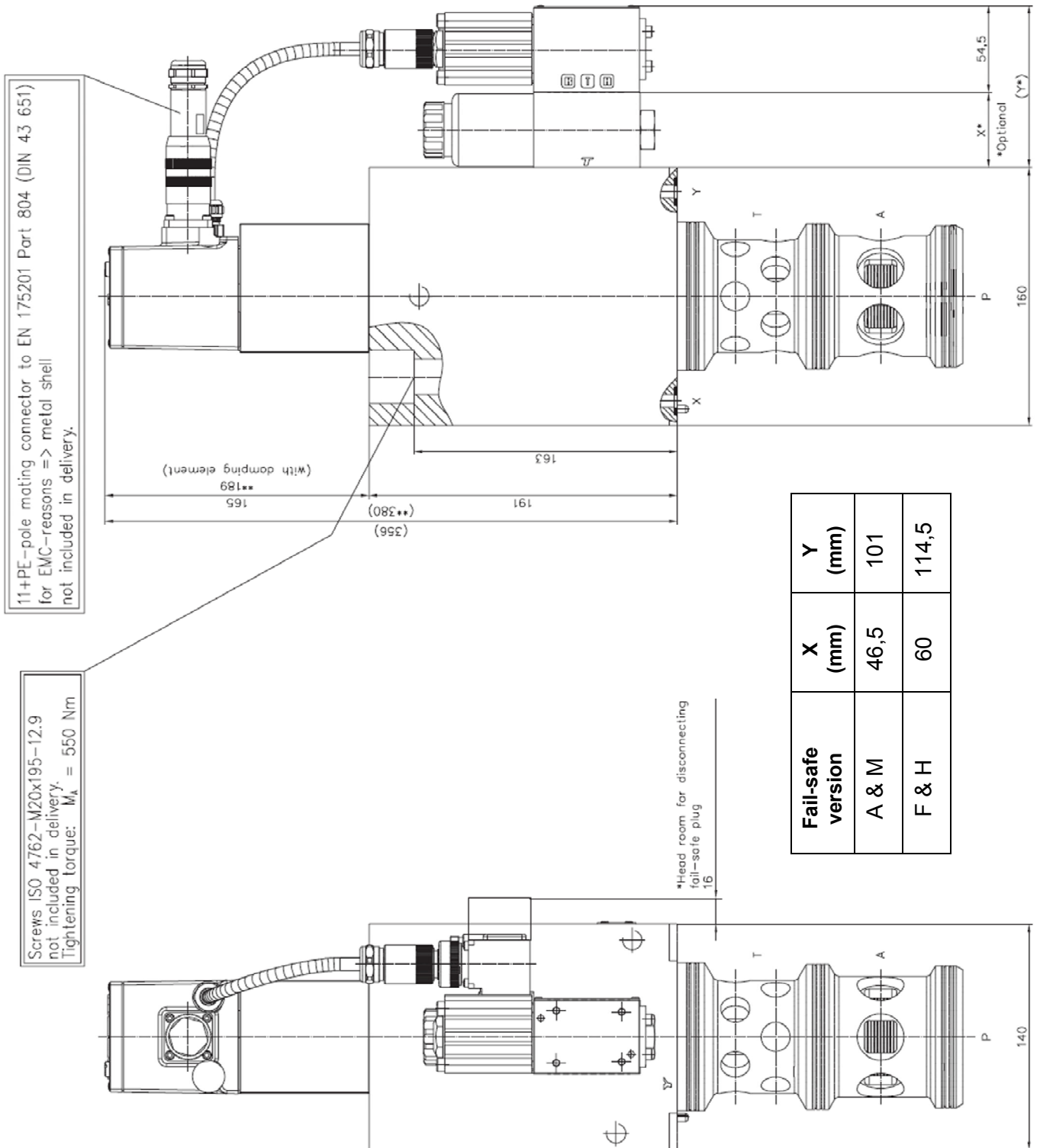
11+PE-pole mating connector to EN 175201 Part 804 (DIN 43 651) for EMC-reasons => metal shell not included in delivery.

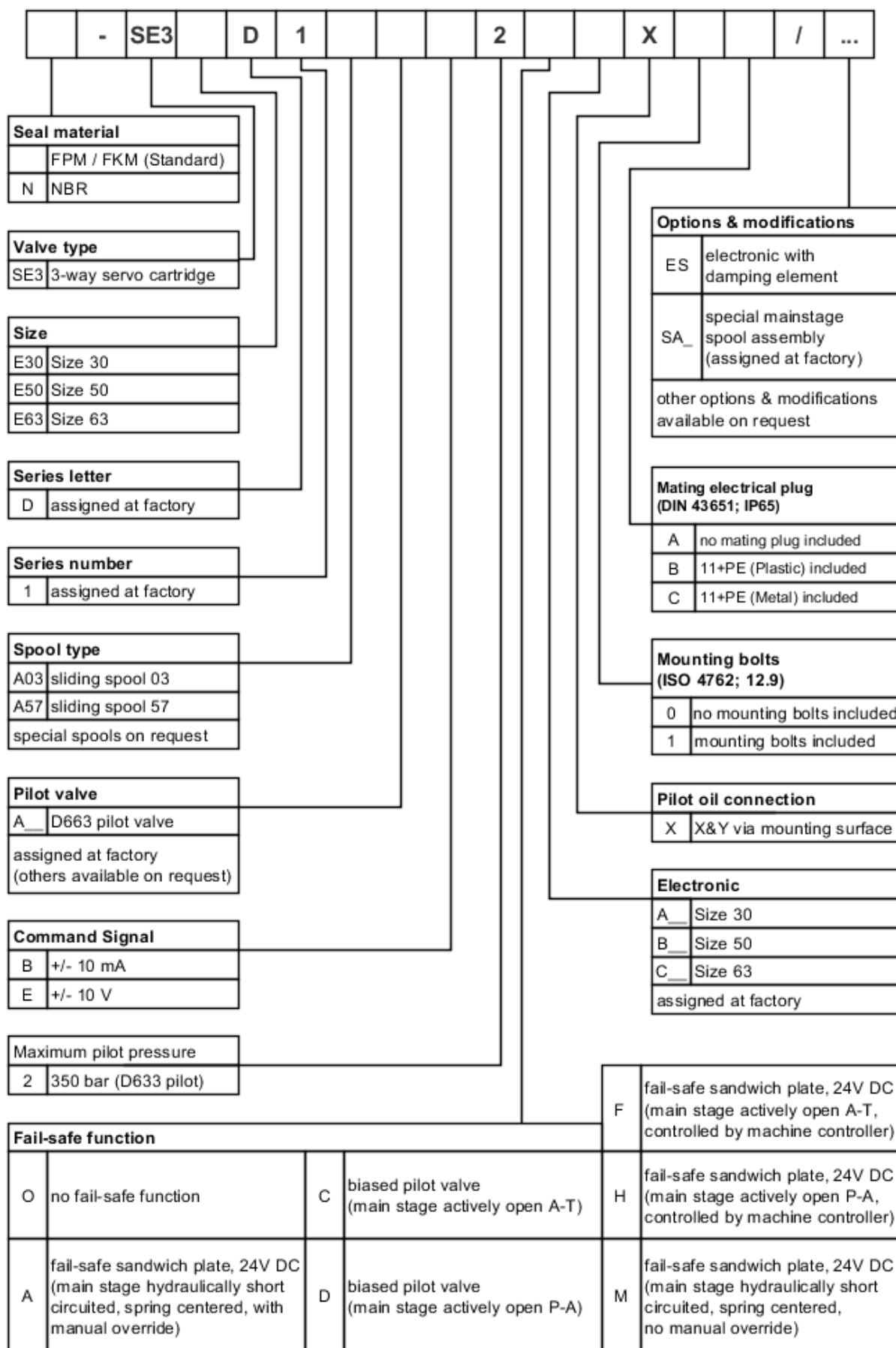
Screws ISO 4762-M16x150-12.9 not included in delivery. Tightening torque:  $M_a = 300 \text{ Nm}$



# DIMENSIONS - SIZE 63

# SE3





# CONFIGURATION CHECKLIST

# SE3

6100 – 004e – 017 (old: 7-3-FE04)

Issue: 1.0

Customer			
Fill Out Date (Customer)		Prepared by	
Application			
Please fill out the form as accurately as possible; mark selection fields with an "X"			

Basic Data			
Nominal valve size		Spool type (03, 57) <sup>1)</sup>	
Fluid		Seal material (Standard = FKM)	
Fluid temperature	°C	Ambient temperature	°C

<sup>1)</sup> Please specify special spool types!

Hydraulic Data								
Pilot pressure [bar]				Main stage pressure [bar]				
Pilot valve (DDV = Standard)	DDV		D661	Filter subplate for Pilot valve DDV [Y/N]	Y		N	X
P-A max. [L/min] / Δp [bar]				A-T max. [L/min] / Δp [bar]				
P-A min. [L/min] / Δp [bar]				A-T min. [L/min] / Δp [bar]				
P-A [L/min]				Δp [bar]				
A-T [L/min]				Δp [bar]				
Max. response time [ms]				Pressure control <sup>3)</sup>	Y		N	
Response time FS [ms] <sup>2)</sup>								
Failsafe spool position (Main stage)	P-A		A-T	Failsafe function (Biased pilot, FS-valve)	Biased Pilot		FS-Valve	
	mech. centered							

<sup>2)</sup> Consider longer FS times for biased DDV's instead of DDV's with axis cut

<sup>3)</sup> not available with integrated electronics

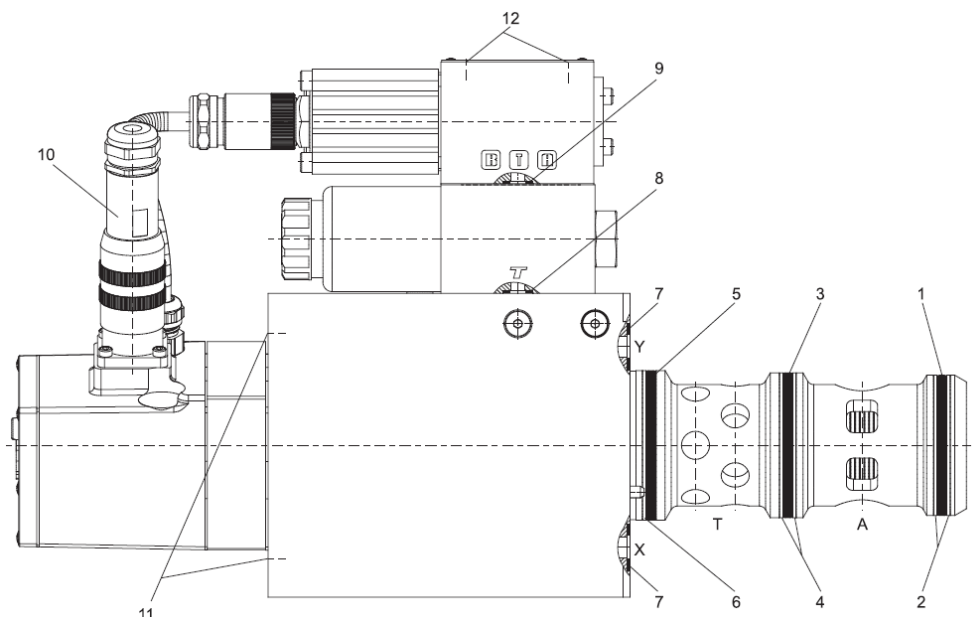
Electrical Data					
Command signal (Standard = +/- 10 Volt)		± 10 Volt	→ Feedback ± 10 Volt (Type E)		
		± 10 mA	→ Feedback 4... 20 mA (Type B)		
Electrical connector (Standard = 11 + Pe)	11 + Pe		Control fail-safe valve	extern	

Miscellaneous							
Fastening screws Included in delivery [Y/N]	Y		N	Electrical connector Included [Y/N]	Y		N
Electronic w/ damping elements [Y/N]	Y		N				

Remarks :			

Allocated part number	XLB	Closing Date (Moog)	
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**Main stage (sleeve and cover)**

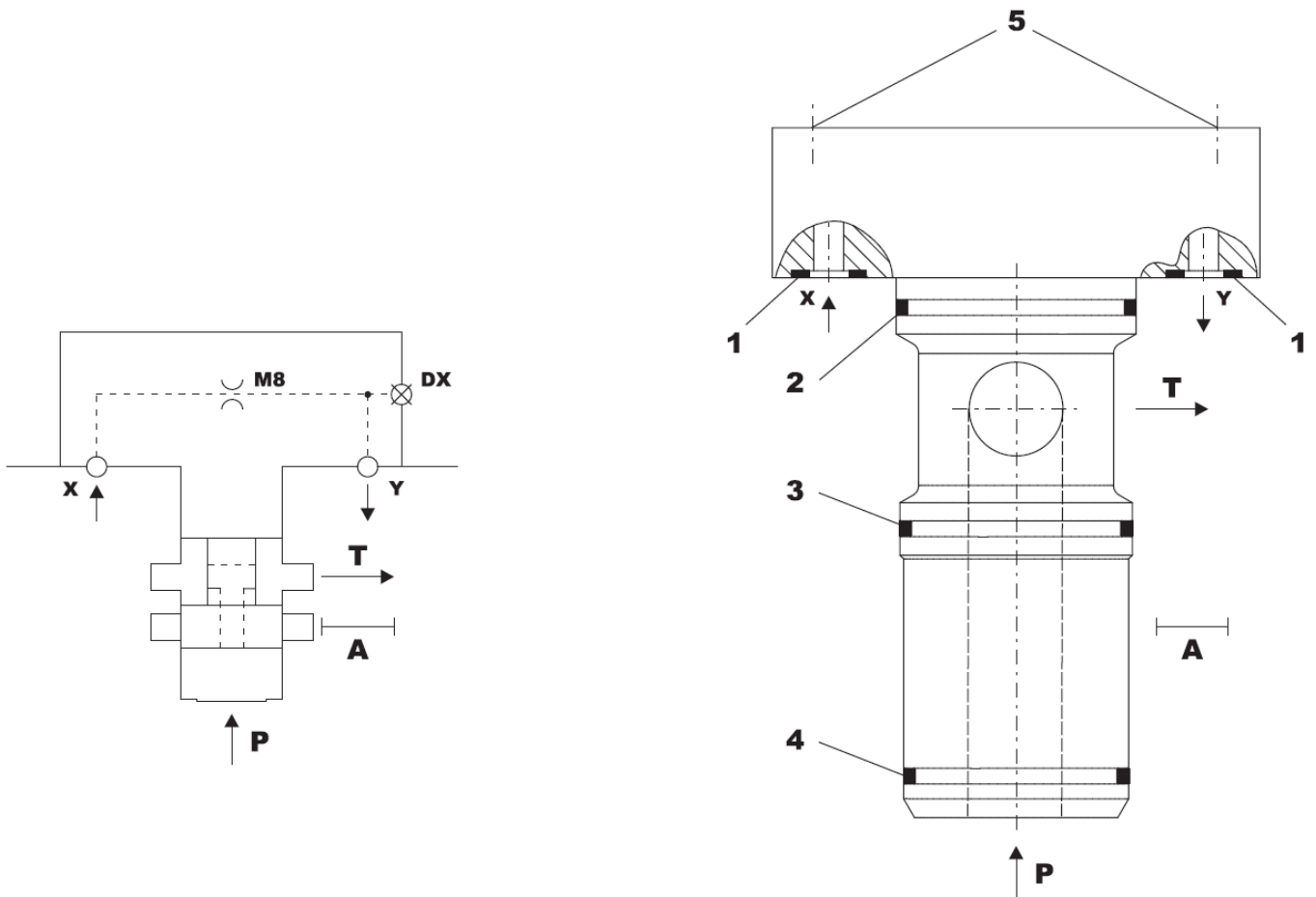
FPM/FKM Seals for Main Stage <sup>1</sup>				
Pos.	Description	Ordering number		
		Size 30	Size 50	Size 63
1-7	Seal kit	XEB17268-000-00	XEB17267-000-00	XEB16492-000-00
1	O-ring	X980-02125	X980-02227	X980-02235
2	Backup ring	X780-08125	X780-08227	X780-18235
3	O-ring	X980-02126	X980-02227	X980-02236
4	Backup ring	X780-08126	X780-18227	X780-18236
5	O-ring	X980-02127	X980-02228	X980-02237
6	Backup ring	X780-08127	X780-18228	X780-08237
7	O-ring	X980-02012	X980-02114	X980-02112
Mounting Bolt for Main Stage (quantity 4 needed)				
11	Mounting bolt (ISO 4762; 12.9)	X784-11629 (M16x130)	X784-11608 (M16x150)	X784-12005 (M20x195)
11	Torque (Nm)	300	300	550
Mating electrical plug				
10	11 + PE (metal)	XEB17725-000-00		
10	11 + PE (plastic)	XEB18267-000-00		

**Pilot stage (D663 and fail-safe)**

FPM/FKM Seals for Pilot Stage <sup>1</sup>				
Pos.	Description <sup>1</sup>	Ordering number		
8	Seal kit – fail-safe (A & M)	XEB18268-000-00		
8	Seal kit – fail-safe (F & H)	available on request		
9	Seal kit – D663	XEB17868-000-00		
Mounting Bolt for Pilot Valves (quantity 4 needed)				
Pos.	Description	D633	D663 + fail-safe (function A)	D663 + fail-safe (function F + H)
12	Mounting bolt (ISO 4762; 12.9)	X784-10522 (M5x60)	X784-10537 (M5x105)	X784-10515 (M5x120)
12	Torque (Nm)	8	8	8

<sup>1)</sup> Other seal materials available on request





**Flushing Sleeve**

For best performance and reliability use a flushing sleeve before installing the SE3 cartridge valve in the manifold.

FPM/FKM Seals for Flushing Sleeve <sup>1)</sup>				
Pos.	Description	Ordering number		
		Size 30	Size 50	Size 63
1-4	Seal kit	XEB18270-00-00	XEB18271-000-00	XEB18272-000-00
1	O-ring	X980-02012	X980-02114	X980-02112
2	O-ring	X980-02127	X980-02228	X980-02237
3	O-ring	X980-02126	X980-02227	X980-02236
4	O-ring	X980-02125	X980-02227	X980-02235
Mounting Bolt for Flushing Sleeve (quantity 4 needed)				
5	Mounting bolt (ISO 4762; 12.9)	X784-11615 (M16x40)	X784-11612 (M16x45)	X784-12001 (M16x60)
5	Torque (Nm)	300	300	550

<sup>1)</sup> Other seal materials available on request



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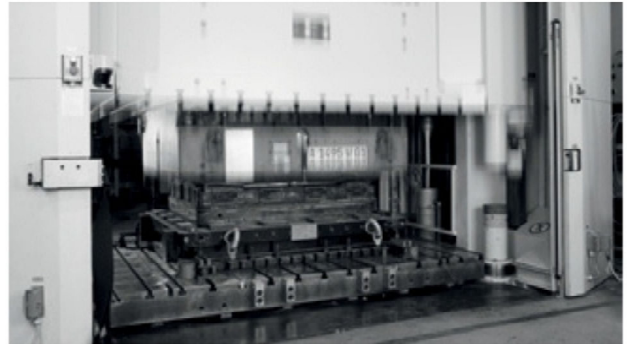
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3- Way Servo Cartridge Valves

SE3-1-EN-3-Way Servo Cartridge Valves - CDL66646-001-B-04-2017