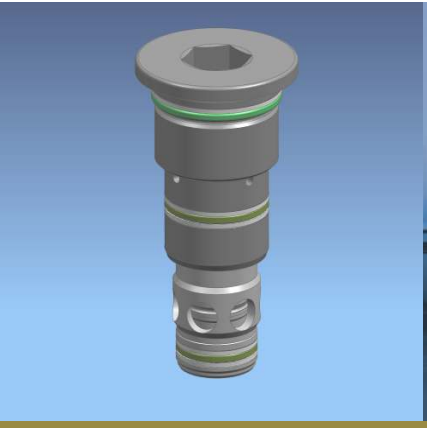
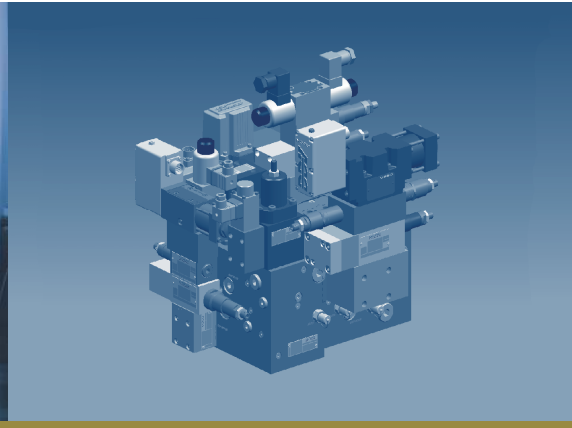




CEE and REE 2-way cartridge valves for plug-closed installation cavities
NG16 & NG25

Operation principle / applications

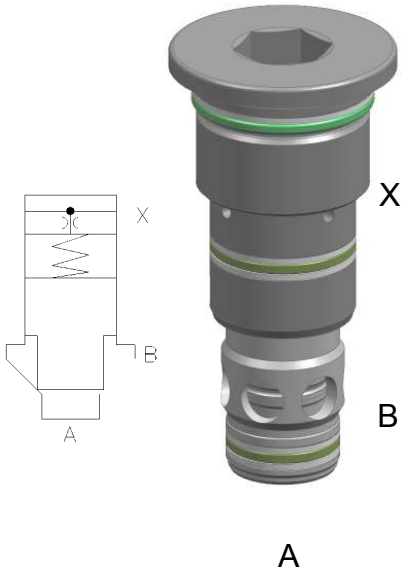
CEE and REE 2-way cartridge valves have two working ports (A and B) and a pilot port X.

Pressure, directional and check functions are possible. Depending on the function desired, flow through the valve can be from either A to B or B to A.

The valves are leak free in port A due to the design of the poppet valve seat. For a leak free port B, it is possible to fit many of the poppet types with a shaft seal. This will separate port B from the pilot port X.

CEE and REE 2-way cartridge valves are used primarily in hydraulic manifolds in combination with other valves to create application specific hydraulic circuits.

The valves are available in sizes 16 and 25.



Advantages

- Maximum operating pressure: 420 bar
- Streamlined design for optimized flow
- Space saving installation in manifolds, eliminating the need for bulky covers.
- No limit to possible manifold installation depths when combined with a recessed plug (metric high pressure plug)

Performance

- Nominal flow at 3 bar Δp (Directional valve, B poppet, flow direction from A to B, without spring, valve fully opened):
  - Size 16: 370 L/min
  - Size 25: 540 L/min

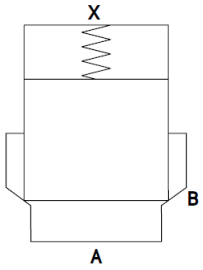
Note: When selecting a valve size, care should be taken to ensure that a maximum oil velocity of 30 m/s in the A port is not exceeded.

General Technical Data	Limit	Units	Comments	
Valve type	-	-	2-way cartridge under plug	
Type designation	-	-	CEE or REE	
Valve design	-	-	Seated valve	
Mounting type	-	-	Manifold mounting	
Size	-	-	16	25
Plug hex key size		mm	19	24
Plug torque	-	Nm	370 (M38x1,5)	750 (M52x1,5)
Approximate weight	-	kg	0,55	1,3
Cavity	-	-	see cavity dimensions on page 6 + 7	
Preferred orientation	-	-	any	
Flow direction	-	-	A ⇔ B (Directional function) A ⇨ B (Check function, B ⇨ A is blocked) A ⇨ B (Pressure function)	
Operating pressure	max.	bar	420	
Ambient temperature	min.	°C	-30	
	max.	°C	+80	
Seal material / hydraulic fluid	-	-	NBR* : Mineral oil, HFB and HFC hydraulic fluids	
	-	-	FKM** : Mineral oil and HFD hydraulic fluids	
	-	-	other hydraulic fluids on request	
Hydraulic fluid temperature	-	°C	-30 to +80 for NBR seals	
			-20 to +80 for FKM-seals	
Recommended viscosity	min.	mm²/s	15	
	max.	mm²/s	46	
Permissible viscosity	min.	mm²/s	2,8	
	max.	mm²/s	380	
Recommended cleanliness for functional safety			ISO 4406 class 20/18/15	
Recommended cleanliness for longer service life			ISO 4406 class 17/14/11	
$MTTF_d$ value; ISO13849-1		Years	150	

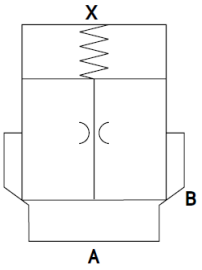
* NBR : Nitrile rubber (Buna-N)
** FKM : Fluoroelastomer

Pressure functions

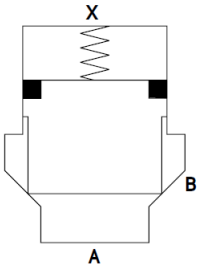
AO/KOB poppet



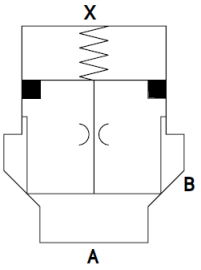
AO/K99 poppet



EX/KOB poppet

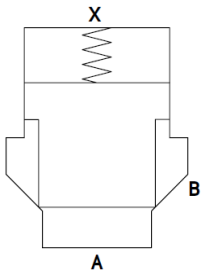


EX/K99 poppet

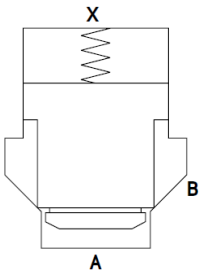


Directional functions

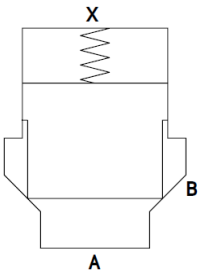
BO poppet



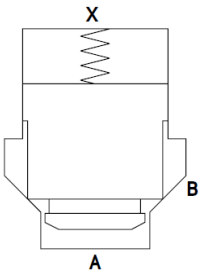
CO poppet



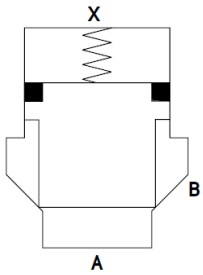
EO poppet



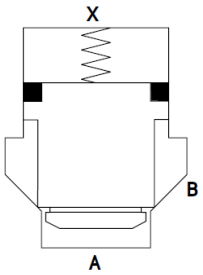
FO poppet



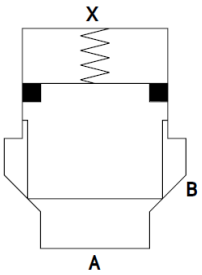
BX poppet



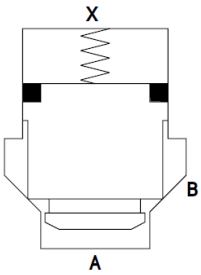
CX poppet



EX poppet

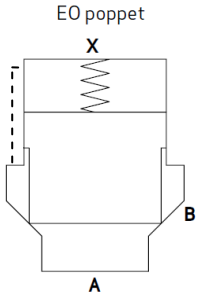


FX poppet



Check functions (see page 10 for further details)

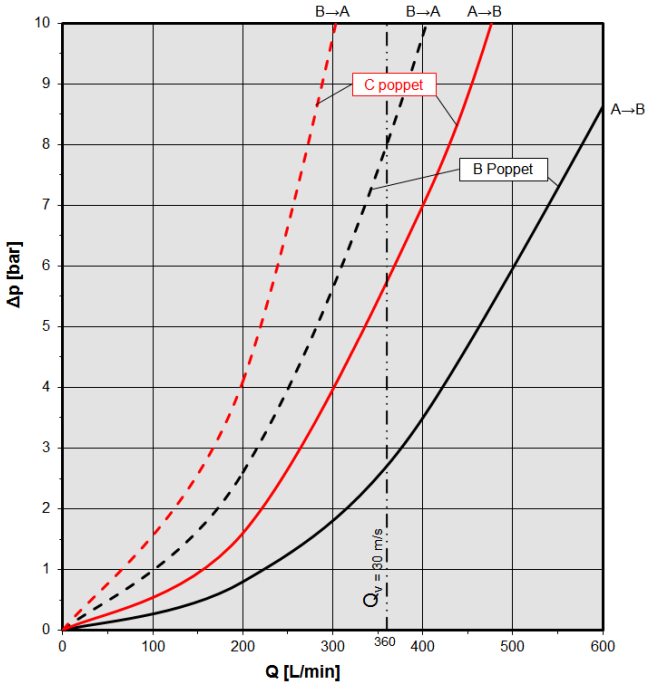
EO poppet



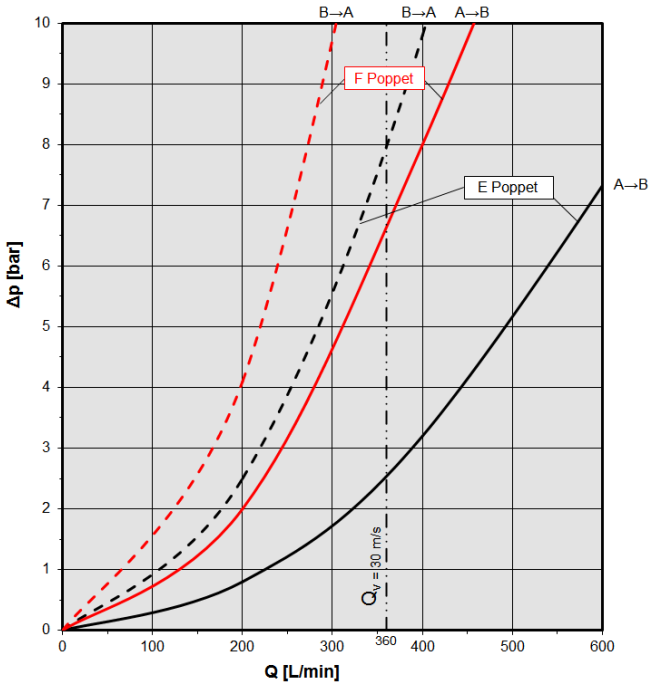
More detailed information regarding the various poppet types and configurations can be found in the Moog "2-Way Slip-In Cartridge Valves" catalog.

Size 16

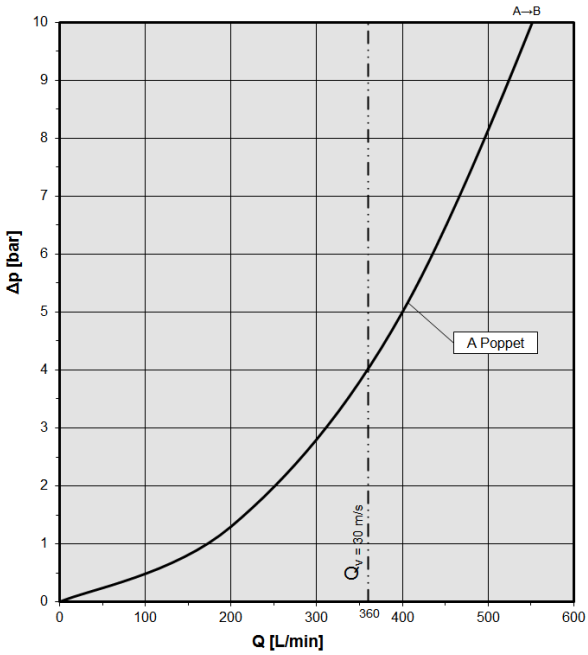
BO/BX; CO/CX Poppets



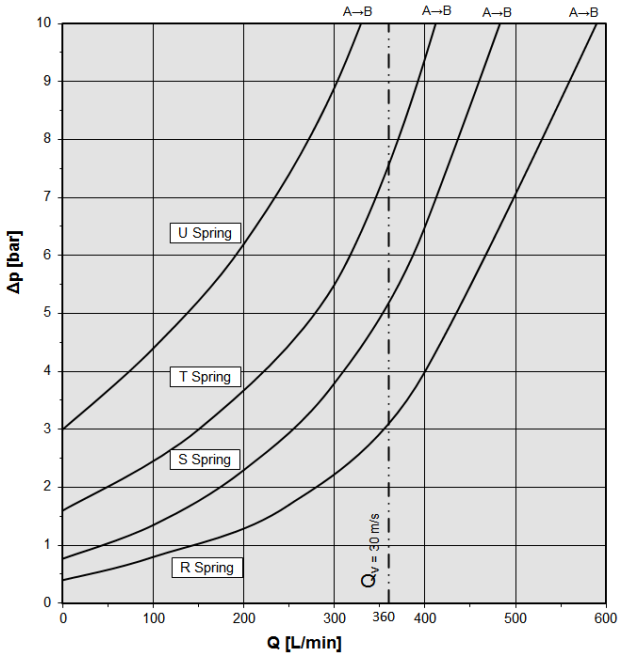
EO/EX; FO/FX Poppets



AO Poppet



EO Poppet (Check function)

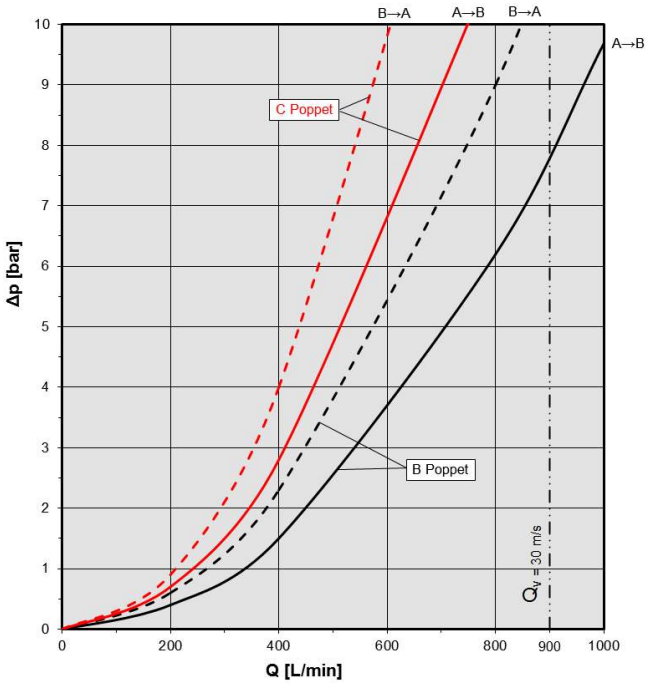


Note:

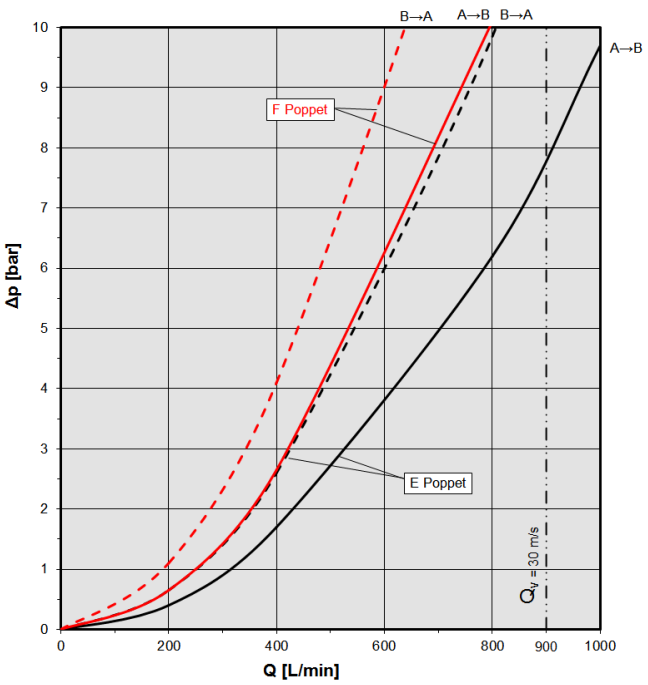
- All performance curves (except check function) were measured without a valve spring.
- Cartridges with AO poppets should only be used for pressure control functions. For a pressure relief function it is important that the pressure in port X not greatly exceed the pressure in port A, otherwise damage to the valve seat may occur.
- The flow value of 360 L/min is equivalent to a flow velocity of 30 m/s though the A port of an ISO 7368 standard installation cavity. This flow velocity should not be exceeded.

Size 25

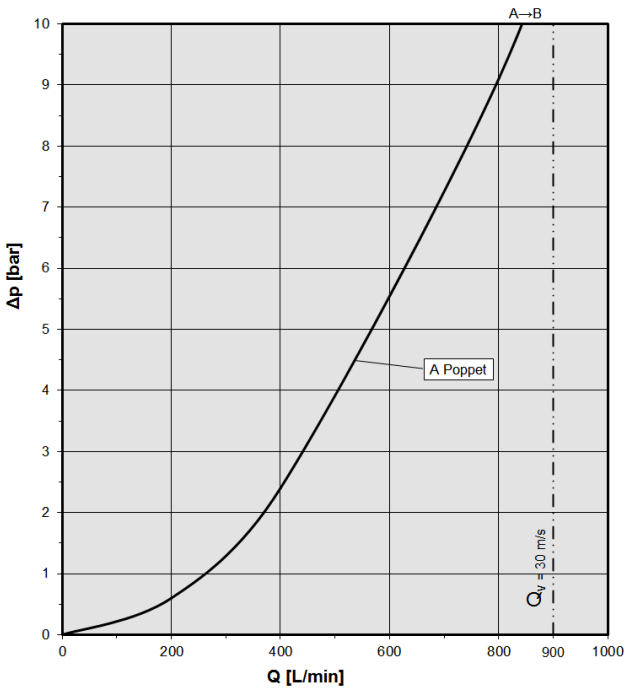
BO/BX,CO/CX Poppets



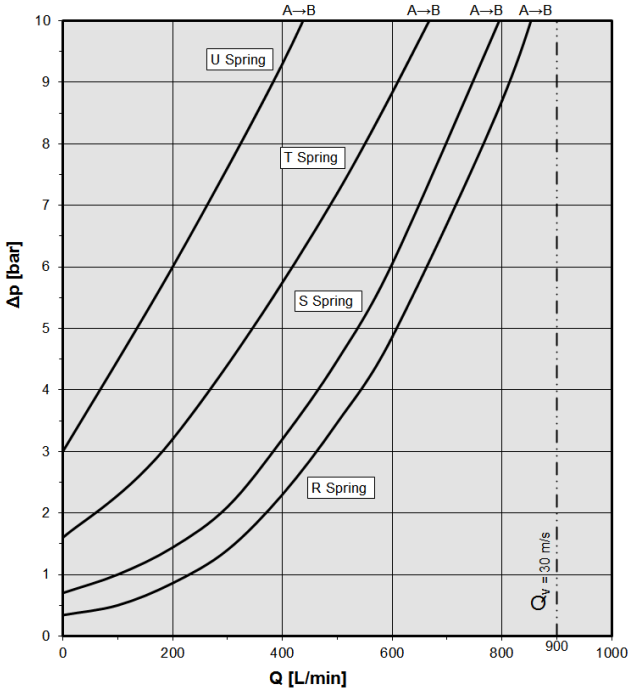
EO/EX; FO/FX Poppets



AO Poppet



EO Poppet (Check function)

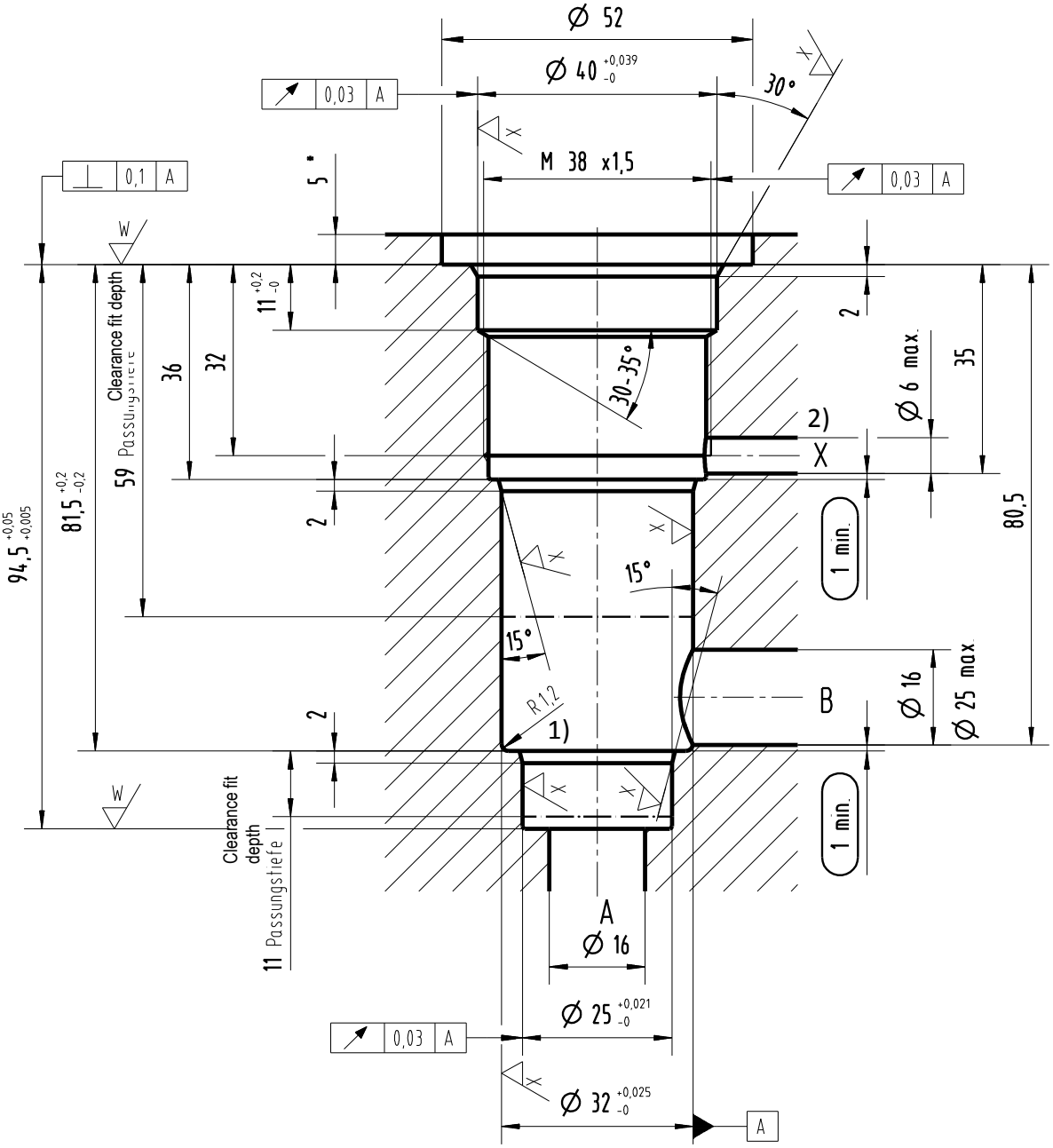


Note:

- All performance curves (except check function) were measured without a valve spring.
- Cartridges with AO poppets should only be used for pressure control functions. For a pressure relief function it is important that the pressure in port X not greatly exceed the pressure in port A, otherwise damage to the valve seat may occur.
- The flow value of 900 L/min is equivalent to a flow velocity of 30 m/s though the A port of an ISO 7368 standard installation cavity. This flow velocity should not be exceeded.

Size 16 (Moog cavity W407)

*minimum recommended countersink depth to ensure that the plug remains flush with the manifold surface.



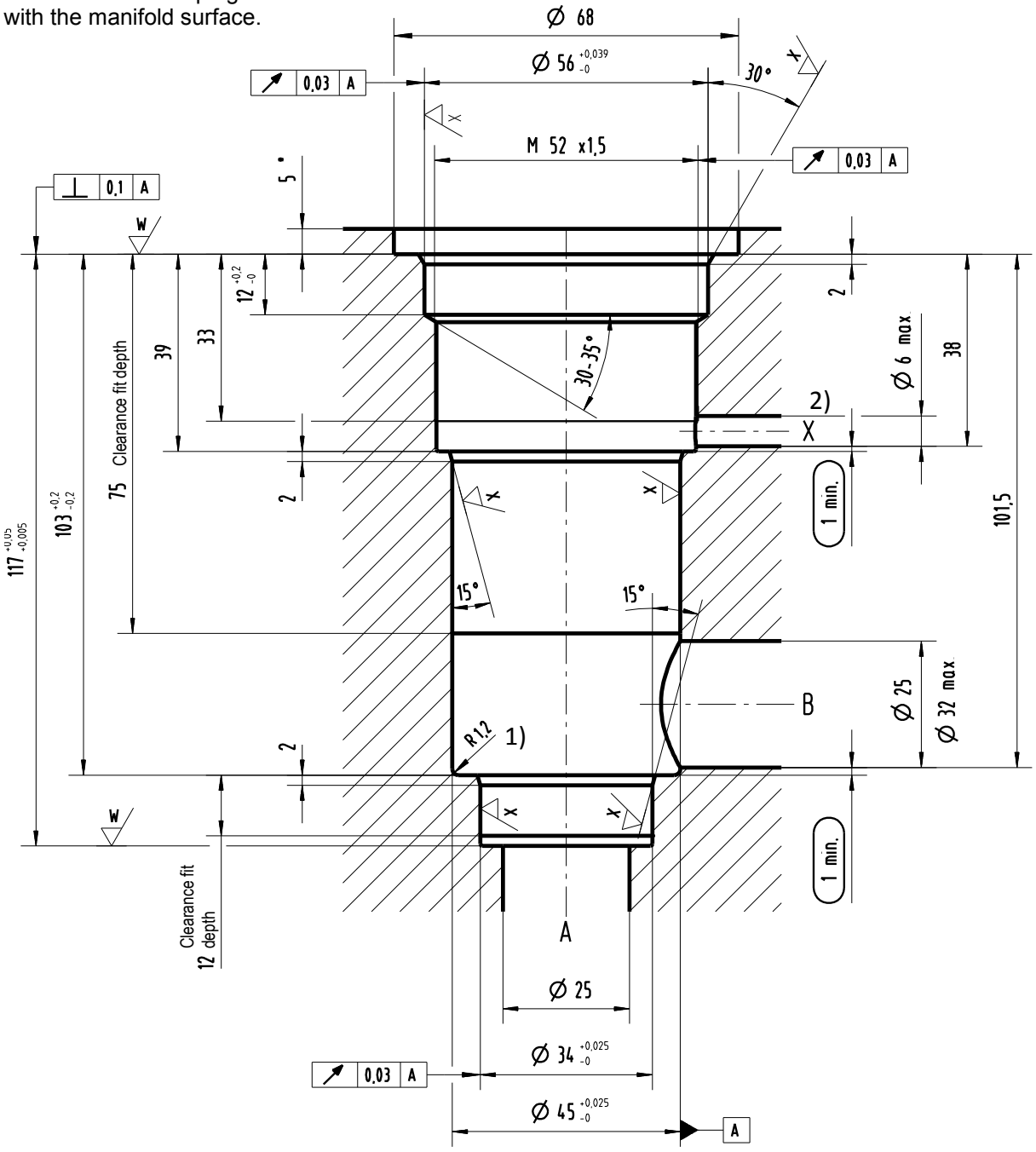
1) For operating pressures over 350 bar Moog recommends an additional flanging radius of 1.2mm, a deviation from the standard ISO 7368 cavity.

2) The X port is not needed for a REE check function.

T	U	V	W	X	Y	Z
◇	Rz 63	Rz 25	Rz 16	Rmax10	Rz 4	Rz 1

Size 25 (Moog cavity W408)

*minimum recommended countersink depth to ensure that the plug remains flush with the manifold surface.



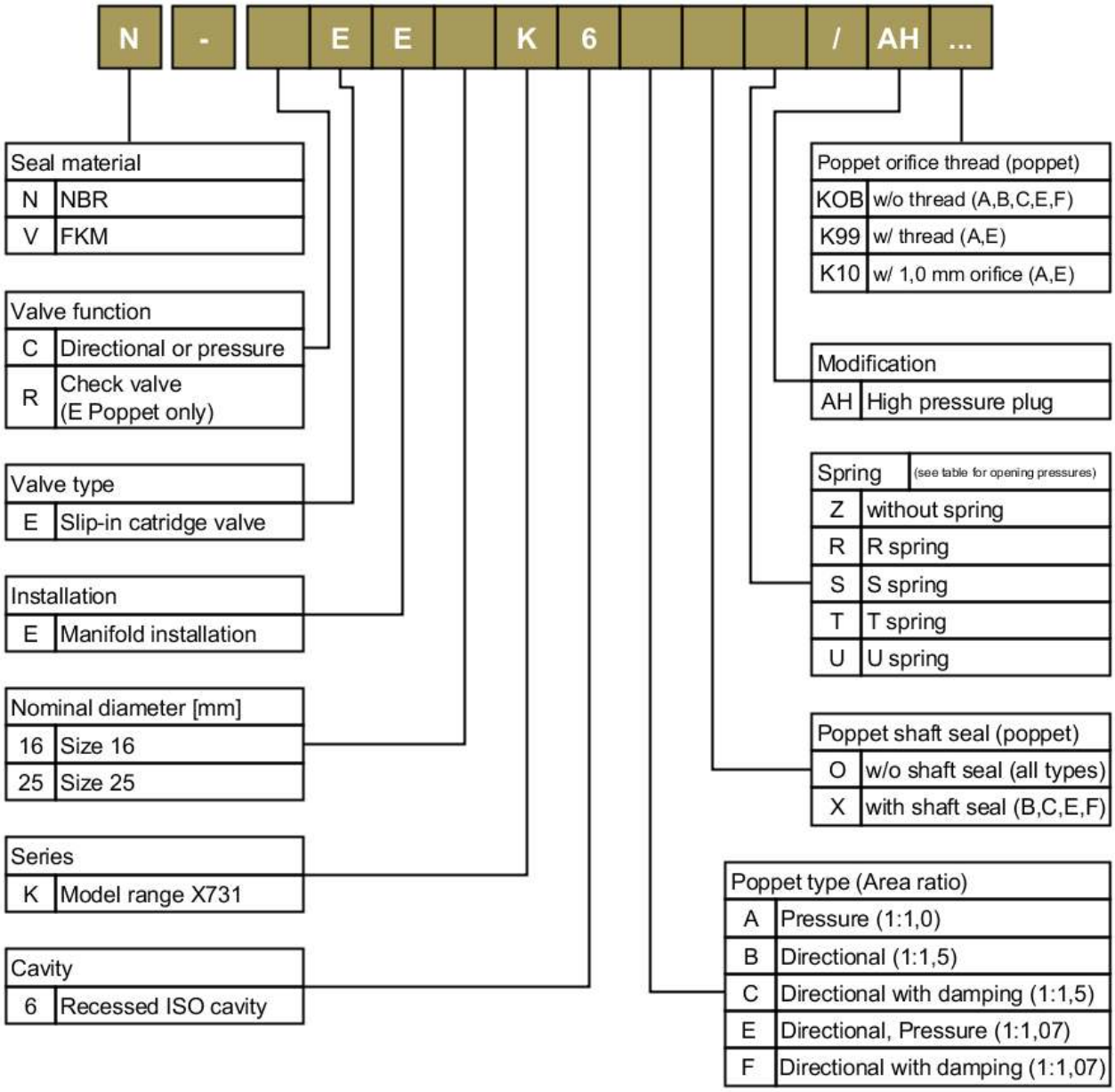
1) **For operating pressures over 350 bar Moog recommends an additional flanging radius of 1.2mm, a deviation from the standard ISO 7368 cavity.**

2) **The X port is not needed for a REE check function.**

U (W, X)

T	U	V	W	X	Y	Z
	Rz 63	Rz 25	Rz 16	Rmax10	Rz 4	Rz 1

Ordering code

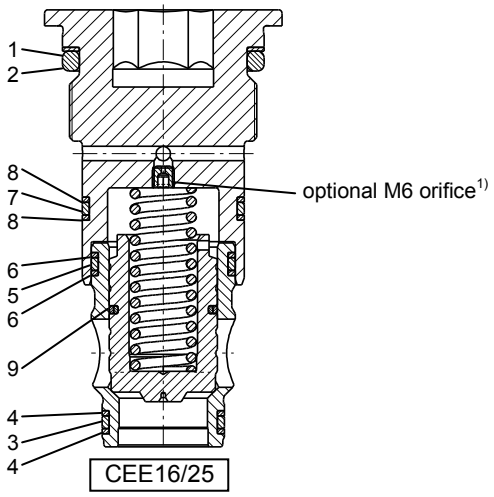


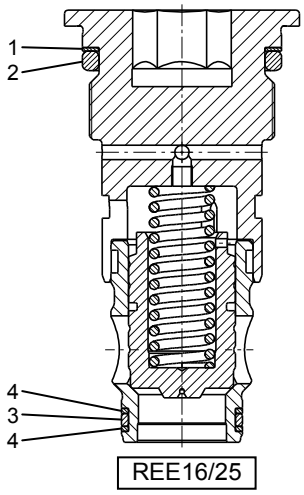
Spring opening pressures [bar]

Flow direction A → B						
	A Poppet		B, C Poppet		E, F Poppet	
Spring	16	25	16	25	16	25
R	0,5	0,5	0,5	0,5	0,3	0,4
S	1,0	1,0	1,0	1,0	0,7	0,7
T	2,0	2,0	1,9	2,1	1,4	1,5
U	4,0	4,0	3,8	4,2	2,7	3,0

Flow direction B → A				
	B, C Poppet		E, F Poppet	
Spring	16	25	16	25
R	0,9	1,0	5,4	5,3
S	1,9	2,1	10,8	10,6
T	3,8	4,2	21,5	21,1
U	7,6	8,3	43,1	42,3

Note: When using a cartridge with a shaft seal (BX, CX, EX or FX poppet), Moog recommends using the strongest available spring to ensure a secure closing against the friction force of the shaft seal.





[1] plug orifice should be ordered separately

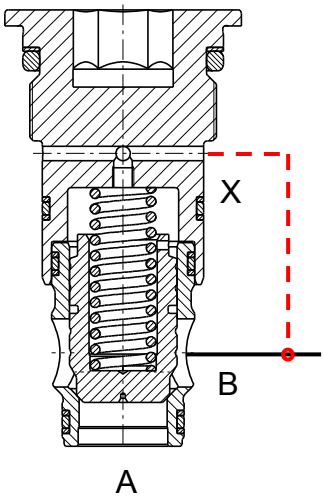
Preferred cartridge types (NBR) [2]		
Size	**Description**	**Part number**
16	N-CEE16K6AOU/AH	X731-016AOU-900N00
	N-CEE16K6BOT/AH	X731-016BOT-900N00
	N-CEE16K6BXU/AH	X731-016BXU-900N00
	N-CEE16K6COT/AH	X731-016COT-900N00
	N-CEE16K6CXU/AH	X731-016CXU-900N00
	N-CEE16K6EOT/AH	X731-016EOT-900N00
	N-CEE16K6EXU/AH	X731-016EXU-900N00
	N-REE16K6EOR/AH	X731R016EOR-900N00
	N-REE16K6EOU/AH	X731R016EOU-900N00
25	N-CEE25K6AOT/AH	X731-025AOT-900N00
	N-CEE25K6BOT/AH	X731-025BOT-900N00
	N-CEE25K6BXU/AH	X731-025BXU-900N00
	N-CEE25K6COT/AH	X731-025COT-900N00
	N-CEE25K6CXU/AH	X731-025CXU-900N00
	N-CEE25K6EOT/AH	X731-025EOT-900N00
	N-CEE25K6EXU/AH	X731-025EXU-900N00
	N-REE25K6EOR/AH	X731R025EOR-900N00
	N-REE25K6EOU/AH	X731R025EOU-900N00

[2] For valves with FKM seals, simply substitute the seal material code letter (N for NBR; V for FKM) in the appropriate part number. For example: the NBR part number X731-025BXU-900**N**00 will be X731-025BXU-900**V**00 for FKM.

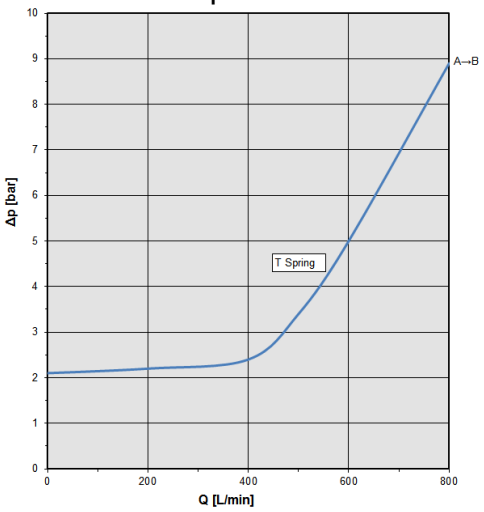
Seal kits for valves without shaft seals		
Valve size (seal position)	**Description**	**Part number**
Size 16 (1-8)	N-CEE16 (NBR seal kit - complete)	X731-016_O_D900N00
	V-CEE16 (FKM seal kit - complete)	X731-016_O_D900V00
Size 16 (1-4)	N-REE16 (NBR seal kit - check function)	X731R016_O_D900N00
	V-REE16 (FKM seal kit - check function)	X731R016_O_D900V00
Size 25 (1-8)	N-CEE25 (NBR seal kit - complete)	X731-025_O_D900N00
	V-CEE25 (FKM seal kit - complete)	X731-025_O_D900V00
Size 25 (1-4)	N-REE25 (NBR seal kit - check function)	X731R025_O_D900N00
	V-REE25 (FKM seal kit - check function)	X731R025_O_D900V00
Seal kits for valves with shaft seals		
Size 16 (1-9)	N-CEE16 (NBR seal kit - complete)	X731-016_X_D900N00
	V-CEE16 (FKM seal kit - complete)	X731-016_X_D900V00
Size 25 (1-9)	N-CEE25 (NBR seal kit - complete)	X731-025_X_D900N00
	V-CEE25 (FKM seal kit - complete)	X731-025_X_D900V00

There are two different options available when configuring a check valve under a plug:

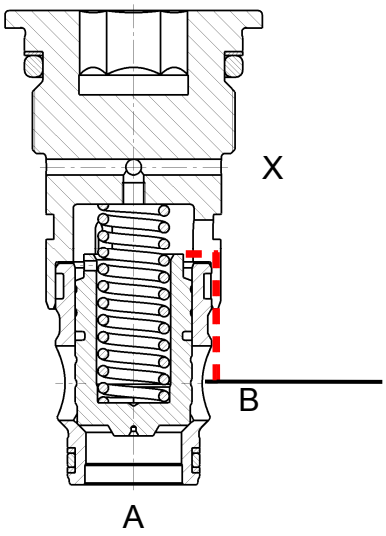
A. The first option is to use a standard cartridge (**CEE**) with a B poppet, a spring (in this case a “T” spring) and X port connection shown in the figure below (connection from B to X via a separate flow path in the manifold).



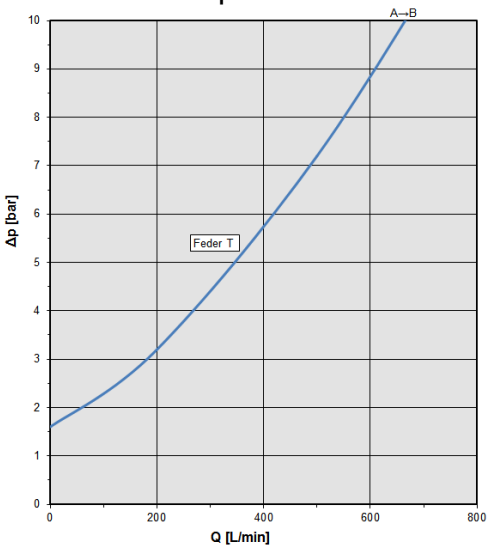
Example: Size 25



B. The second option is to use a check valve cartridge (**REE**) with an E poppet and spring (in this case a “T”). If necessary, a B poppet can also be used, but the flow performance would be comprimised. The X port in this case is connected to B within the cavity itself using a special plug design, eliminating the need for an addition connection within the manifold.



Example: Size 25



Moog recommends option A when configuring a check valve due to the increased flow performance and reduced pressure losses. For further recommendations on how to maximize valve performance, please consult the Moog *“2-Way Slip-In Cartridge Valves”* catalog.

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- Stock management of spare parts and products to prevent unplanned downtime
- Flexible programs, tailored to your needs such as upgrades, preventative maintenance and annual/multiyear contracts
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