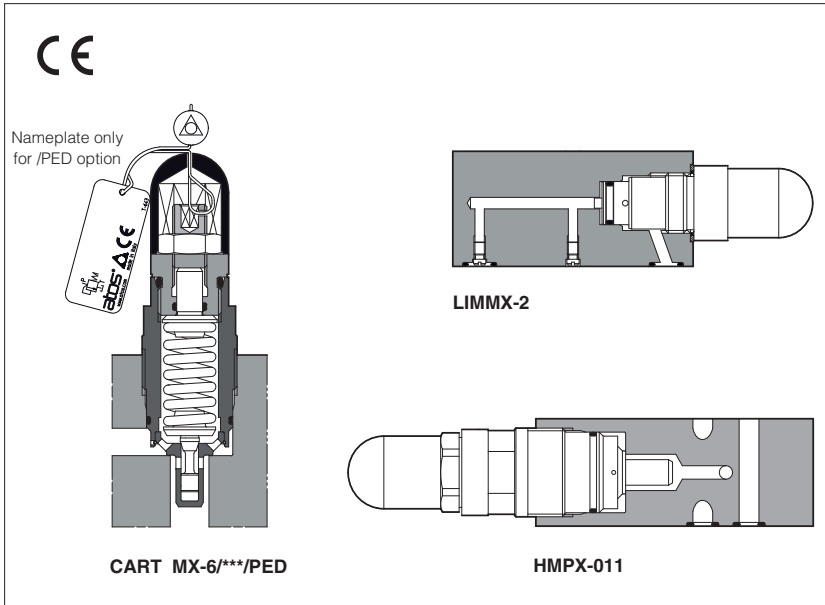


Stainless steel pressure relief valves

screw-in, modular or ISO cartridges



CART-*X(S), HMPX(S), LIMMX(S)

Pressure relief valves made in two different stainless steel executions for corrosive environments:

- **X** stainless steel for external and internal parts, to withstand extreme and corrosive environmental conditions, and to ensure full compatibility also with water base and special fluids.
- **XS** stainless steel for external parts to withstand extreme and corrosive environmental conditions. Internal components are derived from standard valves.

See section [11] for material specification

CART-*X(S): screw-in, direct operated

Max flow: **150 l/min**

Max pressure: up to **420 bar**

Optional PED safety version certified by IMQ according to Pressure Equipment Directive 2014/68/EU

HMPX(S): modular, size 06, direct operated

Max flow: **35 l/min**

Max pressure: up to **350 bar**

LIMMX(S) + SC LIX: ISO cartridge, size 25

Max flow: **370 l/min** at Δp 5 bar

Max pressure: **350 bar**

1 MODEL CODE OF SCREW-IN VALVES

| | | | | | | | | | | | | | |
|--|-------------|---|------------|---|---|---|---|---|---------------|---|---|---|--|
| CART | MX-3 | / | 350 | / | * | / | * | / | ** | / | * | / | * |
| Screw-in pressure relief cartridge | | | | | | | | | Series number | | Seals material , see section [11]: - = HNBR PE = FKM | | Test fluid , only for X execution: H = mineral oil W = pure water |
| <p>Size (1):</p> <p>MX-3, MXS-3 = G1/2 MX-6, MXS-6 = M33x1,5 AREX-20, AREXS-20 = M35x1,5</p> | | | | | | | | | | | | | |
| <p>Max pressure settings: see hydraulic characteristics in section [8]</p> | | | | | | | | | | | | | |
| <p>Options:</p> <p>- = standard version R = reduced leakage for special application - only for CART ARE-20 (standard for CART ARE-20) (2) PED = safety version certified by IMQ according to 2014/68/EU</p> | | | | | | | | | | | | | |
| <p>Only for PED option: 280 = factory preset regulation to be defined depending to the customer requirements min step: 1bar - min pressure setting: 25 bar (example 280 = 280 bar)</p> | | | | | | | | | | | | | |

(1) **X** = Stainless steel execution for all parts
XS = Stainless steel execution for external parts
See section [11] for material specification

(2) Standard execution of CART ARE-20 provides the reduced leakage feature, then the /R is always present in the valve model code

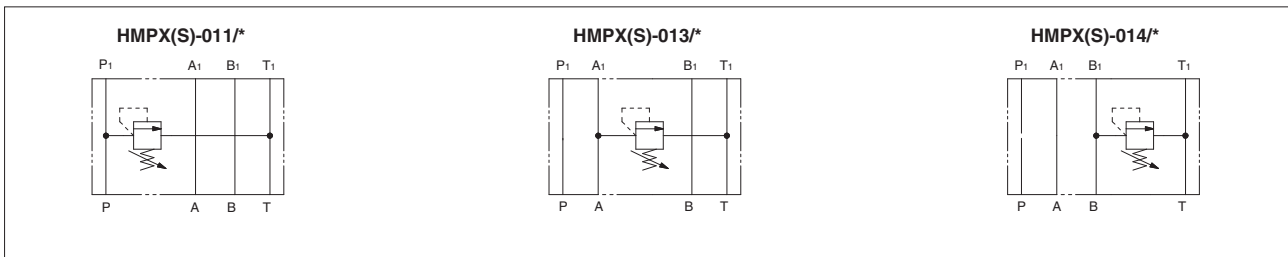
2 HYDRAULIC SYMBOLS



3 MODEL CODE OF MODULAR VALVES

| | | | | | | | | | | | |
|--|----------|---|------------|---|------------|--|---|----------|--|----------|--|
| HMP | X | - | 011 | / | 350 | ** | / | * | / | * | |
| Modular pressure relief valve ISO 4401 size 06 | | | | | | Series number | Seals material, see section 11: - = HNBR PE = FKM | | Test fluid, only for X execution: H = mineral oil W = pure water | | |
| X = Stainless steel execution for all parts XS = Stainless steel execution for external parts | | | | | | | | | | | |
| Configuration, see section 4 | | | | | | | | | | | |
| 011 013 014 | | | | | | | | | | | |
| | | | | | | Pressure range for HMP: | | | | | |
| | | | | | | 50 = 50 bar 210 = 210 bar 100 = 100 bar 350 = 350 bar | | | | | |

4 HYDRAULIC SYMBOLS OF MODULAR VALVES



5 MODEL CODE OF ISO CARTRIDGE VALVES

5.1 Model code of functional cover

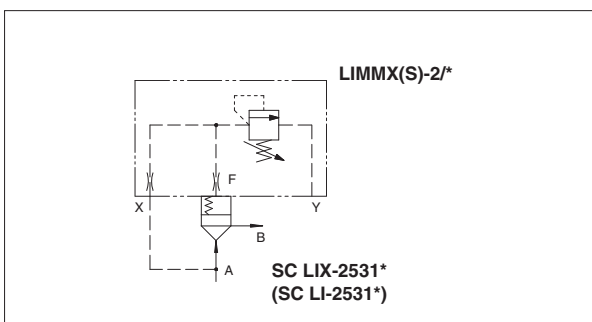
| | | | | | | | | | | | |
|--|----------|---|----------|---|------------|--|---|----------|--|----------|--|
| LIMM | X | - | 2 | / | 350 | ** | / | * | / | * | |
| Cover according to ISO 7368 | | | | | | Series number | Seals material, see section 11: - = HNBR PE = FKM | | Test fluid, only for X execution: H = mineral oil W = pure water | | |
| X = Stainless steel execution for all parts XS = Stainless steel execution for external parts | | | | | | | | | | | |
| Size: 2 = 25 | | | | | | | | | | | |
| | | | | | | Pressure range | | | | | |
| | | | | | | 50 = 6 ÷ 50 bar 210 = 10 ÷ 210 bar 100 = 8 ÷ 100 bar 350 = 15 ÷ 350 bar | | | | | |

5.2 Model code of slip-in cartridges

| | | | | | | | | | | | |
|--|----------|---|-----------|---|-----------|--|---|----------|--|----------|--|
| SC LI | X | - | 25 | / | 31 | ** | / | * | / | * | |
| Cartridge according to ISO 7368 | | | | | | Series number | Seals material, see section 11: - = HNBR PE = FKM | | Test fluid, only for X execution: H = mineral oil W = pure water | | |
| X = Stainless steel execution for all parts | | | | | | | | | | | |
| Size 25 | | | | | | | | | | | |
| Area ratio 1 ÷ 1 | | | | | | | | | | | |
| | | | | | | Spring cracking pressure | | | | | |
| | | | | | | 1 = 0,3 bar 3 = 3 bar 2 = 1,2 bar 6 = 6 bar | | | | | |

Note: for LIMMXS cover, the standard SCLI-25* cartridge can be used

6 HYDRAULIC SYMBOL OF ISO CARTRIDGE VALVES



7 GENERAL CHARACTERISTICS

| | |
|--|---|
| Assembly position / location | Any position |
| Subplate surface finishing | Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101) |
| MTTFd values according to EN ISO 13849 | 150 years, for further details see technical table P007 |
| Ambient temperature | Standard = -40°C ÷ +70°C /PE option = -20°C ÷ +70°C |
| Storage temperature range | Standard = -20°C ÷ +80°C /PE option = -20°C ÷ +80°C |
| Surface protection | Zinc coating with black passivation (body and solenoid housing) |
| Compliance - only CART | PED Directive 2014/68/EU |

8 HYDRAULICS CHARACTERISTICS AND DIAGRAMS OF SCREW-IN VALVES

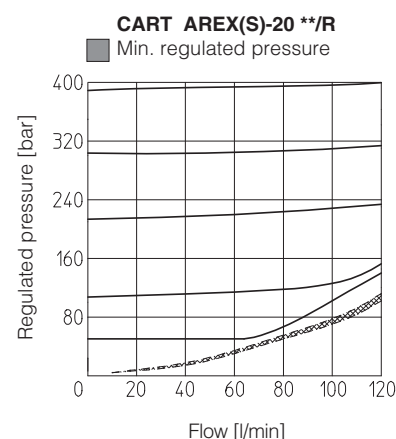
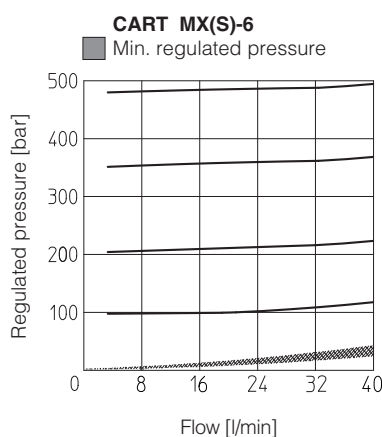
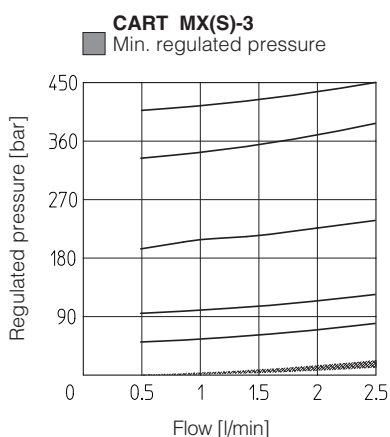
8.1 Hydraulics characteristics

| Valve model | CART MX(S)-3 | CART MX(S)-3 /PED | CART MX(S)-6 | CART MX(S)-6 /PED | CART AREX(S)-20 | CART AREX(S)-20 /PED |
|------------------------------------|----------------------------------|-------------------|----------------------------|-------------------|----------------------------------|----------------------|
| Max pressure setting [bar] | 50 100 210 350 420 | 420 | 50 100 210 350 | 420 | 50 100 210 315 400 | 400 |
| Pressure range [bar] (1) | 4÷50 6÷100 7÷210 8÷350 15÷420 | 25÷420 | 2÷50 3÷100 8÷210 15÷350 | 25÷420 | 3÷50 5÷100 6÷210 8÷315 10÷400 | 30÷420 |
| Max flow [l/min] | 2,5 | 2,5 | 40 | 60 | 120 | 150 |

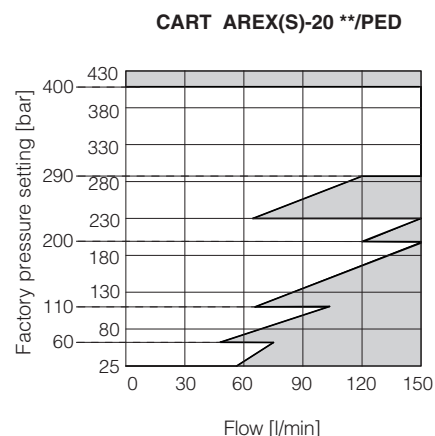
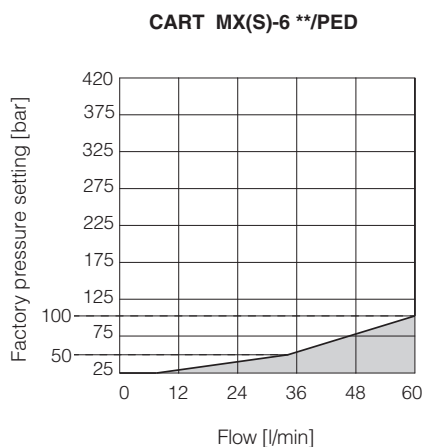
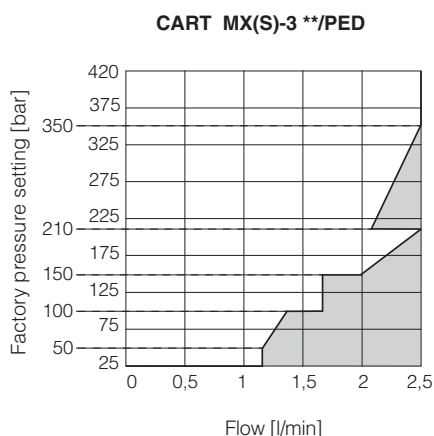
(1) The values correspond to the min and max regulation of the valve's craking pressure

8.2 Diagrams of screw-in valves (based on mineral oil ISO VG 46 at 50°C)

Regulated pressure vs. flow diagrams



Permitted working ranges, only PED option



Notes for PED valves:

- The valves can operate only in the white area of the above diagrams.
The maximum flow values within the white area are those for which the pressure increases of +10% respect to the factory pressure setting.
Pressure / flow values located in gray areas cannot be performed
- The working range in above diagrams is valid with 0 bar in T line.
As general rule PED valves should be operated without counter pressure in the T line.
Differently, in case of counter pressure in T line, the maximum flow is reduced respect to values reported in the diagrams.
There is a relation between the maximum counter pressure, the factory pressure setting and the maximum flow: with a flow near to zero, the maximum counter pressure in T line is 10% of the factory pressure setting.
With increasing flow, the maximum counter pressure in T line must be reduced. Contact Atos technical office for details.

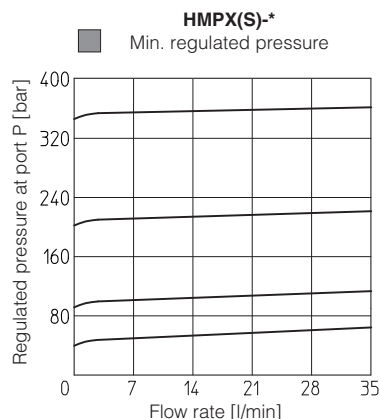
9 HYDRAULICS CHARACTERISTICS AND DIAGRAMS OF MODULAR VALVES

9.1 Hydraulic characteristics of HMPX(S)

| | | |
|----------------------------|--------------------------------|-------------|
| Max pressure setting [bar] | Ports P, A, B = 350 | Port T = 50 |
| Pressure range (1) [bar] | 2÷50 ; 3÷100 ; 10÷210 ; 15÷350 | |
| Max flow [l/min] | 35 | |

(1) The values correspond to the min and max regulation of the valve's craking pressure

9.2 Diagrams of HMPX(S) (based on mineral oil ISO VG 46 at 50°C)

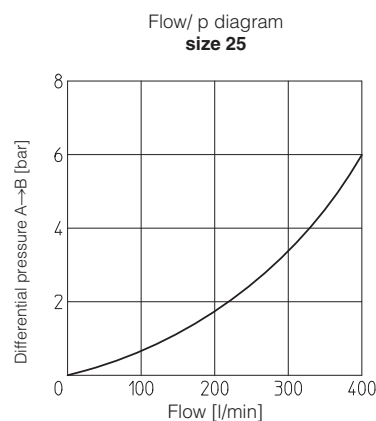


10 HYDRAULICS CHARACTERISTICS AND DIAGRAMS OF ISO CARTRIDGES VALVES

10.1 Hydraulic characteristics of LIMMX(S) functional cover

| | |
|---------------------------|-------------------------|
| Operating pressure | Ports X: 350 bar |
| | Ports Y: 50 bar |

10.2 Diagrams of valves (based on mineral oil ISO VG 46 at 50°C)



10.3 Hydraulic characteristics of SCLIX cartridge

| | |
|---|------------|
| Type of poppet | 31 |
| Operating pressure | 350 |
| Nominal flow at Δp 5bar (l/min) | 370 |
| Functional sketch (Hydraulic symbol) | |
| Typical section | |
| Area ratio A: Ap | 1:1 |

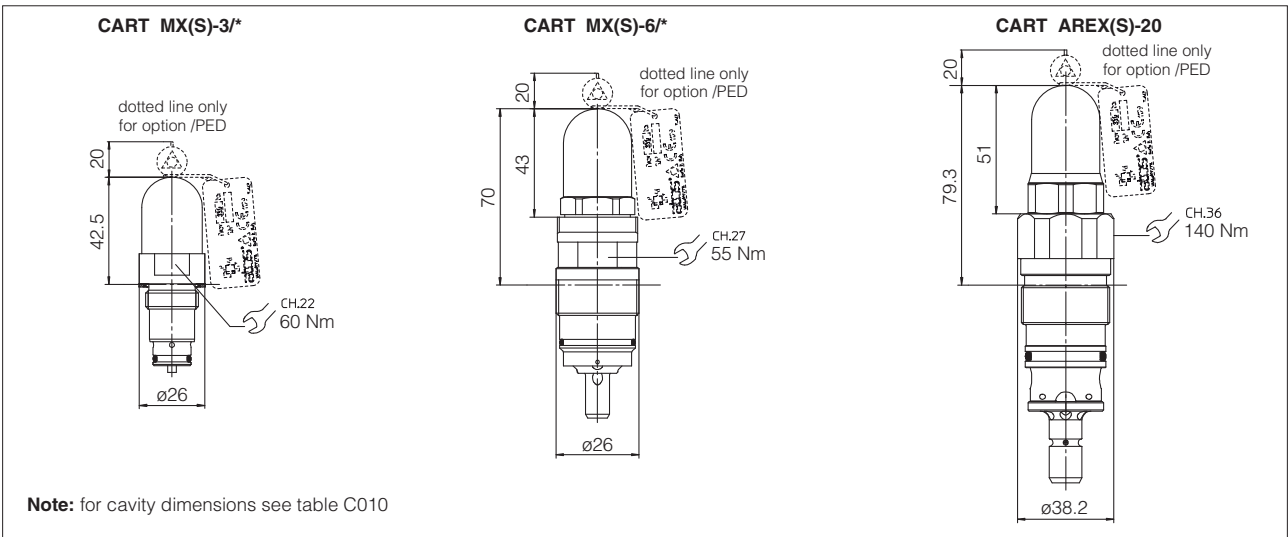
11 MATERIALS SPECIFICATION

| Valve code | Valve type | Valve body | Internal parts for X execution | Internal parts for XS execution | Spring | Seals | |
|------------------|------------------------------|------------|--------------------------------|---------------------------------|----------|-------------|-------------|
| | | | | | | std | /PE |
| CART*X(S) | Screw-in | AISI 316L | AISI 316L, 420B, 630 | Carbon steel | AISI 302 | HNBR (buna) | FKM (viton) |
| HMPX(S) | Modular size 06 | AISI 316L | AISI 316L, 420B, 630 | Carbon steel | AISI 302 | HNBR (buna) | FKM (viton) |
| LIMMX(S) | ISO functional cover size 25 | AISI 316L | AISI 316L, 420B, 630 | Carbon steel | AISI 302 | HNBR (buna) | FKM (viton) |
| SC LIX | ISO cartridge size 25 | AISI 316L | AISI 630, AISI 420B | - | AISI 302 | HNBR (buna) | FKM (viton) |

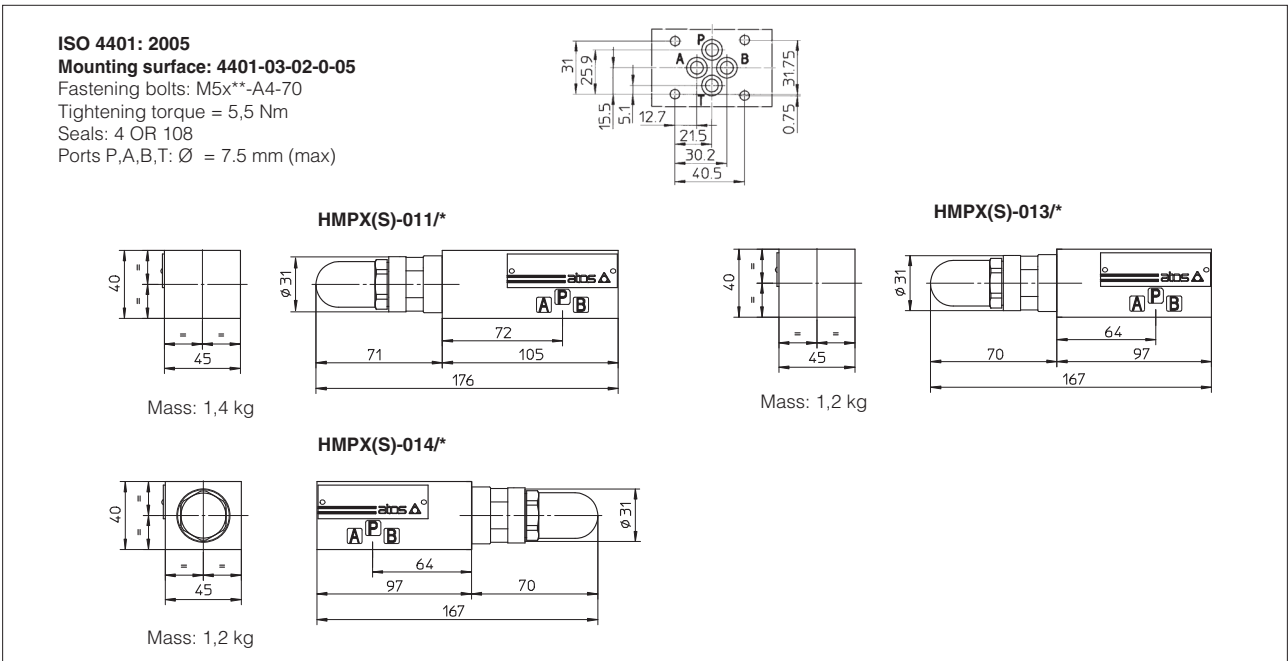
12 FASTENING BOLTS AND SEALS - for modular valve and covers

| Type | Size | Fastening bolts | Seals |
|--------|---------------|--|---------------|
| HMPX | 06 (ISO 4401) | n°4 M5xL-A4-70 Tightening torque = 5,5Nm | n°4 OR-108/BT |
| HMPXS | 06 (ISO 4401) | n°4 M5xL-A4-70 Tightening torque = 5,5Nm | n°4 OR-108/BT |
| LIMMX | 25 (ISO 7368) | n°4 M12x45-A4-70 Tightening torque = 125Nm | n°2 OR-108/BT |
| LIMMXS | 25 (ISO 7368) | n°4 M12x45-A4-70 Tightening torque = 125Nm | n°2 OR-108/BT |

13 INSTALLATION DIMENSIONS OF SCREW IN PRESSURE RELIEF VALVES [mm]



14 INSTALLATION DIMENSIONS OF MODULAR VALVES



15 INSTALLATION DIMENSIONS OF ISO CARTRIDGE VALVES

