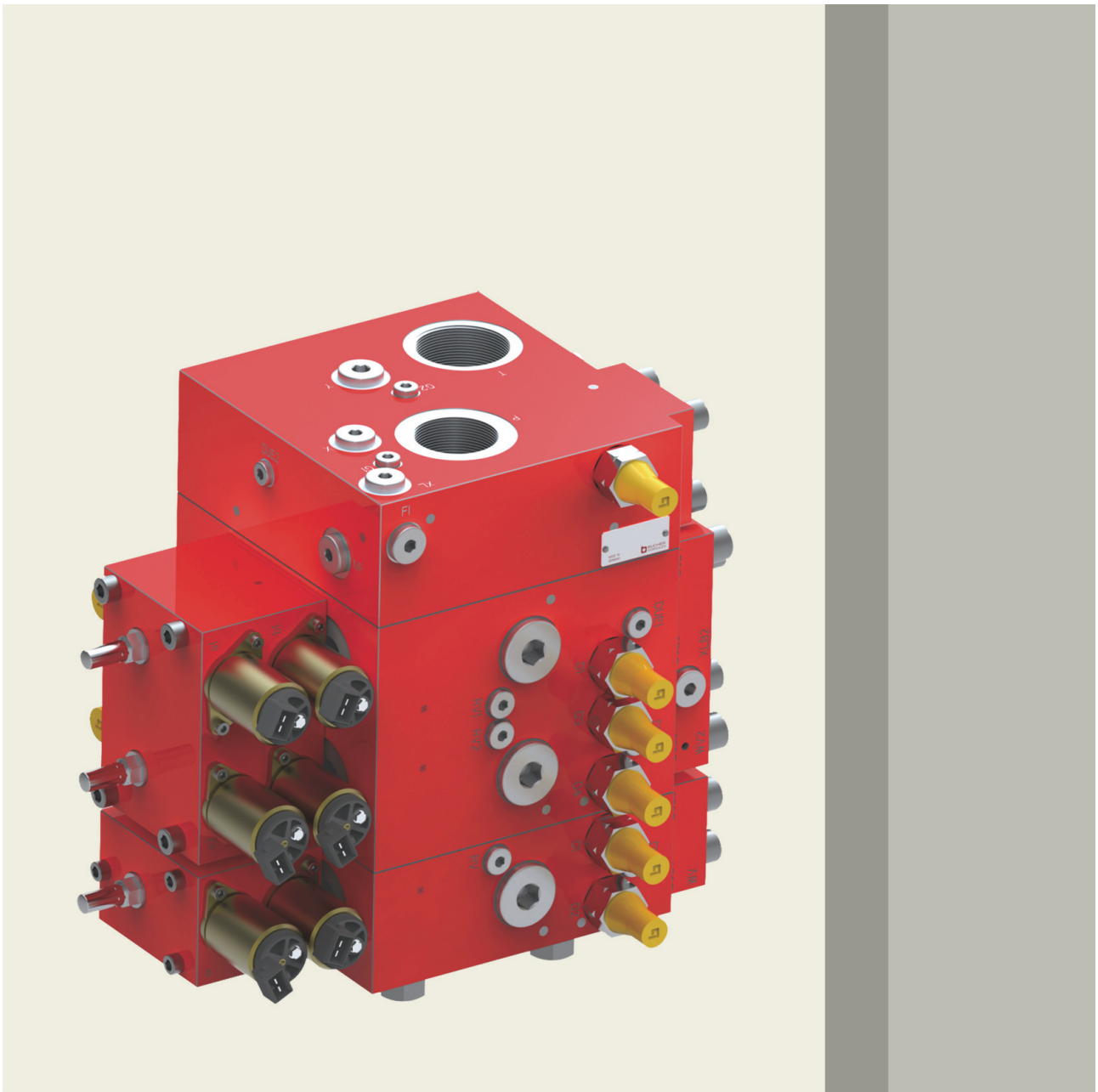


Safety for Hydraulics

Proportional Valves, Sectional Design
Series SC 22



motion and progress

Contents		Page
1	Description	3
2	Technical data	3
3	Performance graphs	5
	3.1 Control characteristics, electro-hydraulic, proportional	5
	3.2 Flow-control characteristics	5
	3.3 Primary-pressure cut-off	6
	3.4 Pressure differential at directional valve spool – Return	6
	3.5 Secondary pressure relief (optional)	6
4	Circuit diagram	7
5	Dimensions	8
	5.1 Dimensions, complete valve	8
	5.2 Dimensions, manual operator	10
6	Ordering code	11
	6.1 Inlet module	11
	6.2 End module	11
	6.3 Actuator module	12
7	Modules	13
	7.1 Inlet modules	13
	7.2 End module: no actuator section	13
	7.3 Actuator modules	14
	7.4 Spool type / Symbol	15

1 Description

Our sectional proportional valves regulate the flow rate to the actuator by means of an internal closed-loop control system. Load-independent flow control is guaranteed by individual pressure compensators upstream of each proportional directional valve (load-sensing principle). The highly adaptable modular system consists of an inlet module, actuator modules (with up to six sections), and an end module and is specially designed for use in mobile hydraulics. The user can be assured that the right system is always available for every application.

This is accomplished by:

- Various inlet modules
- Actuator modules with individual compensator and optional, individually adjustable, primary and secondary pressure-relief valves
- Various types of operators

Use Section 6, "Ordering code", to establish the complete valve code.

2 Technical data

General characteristics	Description, value, unit
Design	proportional valves, sectional design, spool type
Types of operators	<ul style="list-style-type: none"> • electro-hydraulic proportional • hydraulic • manual (oil-tight enclosure) • electro-hydraulic proportional - manual, combined • electro-hydraulic proportional - hydraulic, combined • for other types, please consult Bucher
Size	port sizes to DIN 3852
Mounting attitude	unrestricted, but ensure good air-bleeding
Ambient temperature range	-30 °C ... +60 °C

Hydraulic characteristics	Description, value, unit
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please consult BUCHER
Hydraulic fluid temperature range	-20 °C ... +80 °C, recommended +20 °C ... +60 °C
Viscosity range	10...500 mm ² /s (cSt), recommended 15...250 mm ² /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 20/18/15
Maximum pump flow rate	500 l/min
Maximum actuator flow rate	340 l/min (400 l/min – consult Bucher)
Maximum pump pressure	370 bar
Maximum load pressure	420 bar
Maximum tank pressure	50 bar
Maximum tank pressure with elec. pilot stage	5 bar

Hydraulic operation	Description, value, unit
Pilot-pressure range	6 ... 20 bar
Pressure rating of pilot circuit	max. 50 bar

Size	Description, value, unit
Actuator	A / B G 1¼"
Pump	P G 1¼"
Tank	T G 1½"
Load sensing	XL G ¼"
Pump for pilot stage	X G ¼"
Tank for pilot stage	Y G ⅜"
Test point for pump pressure	MP G ¼"

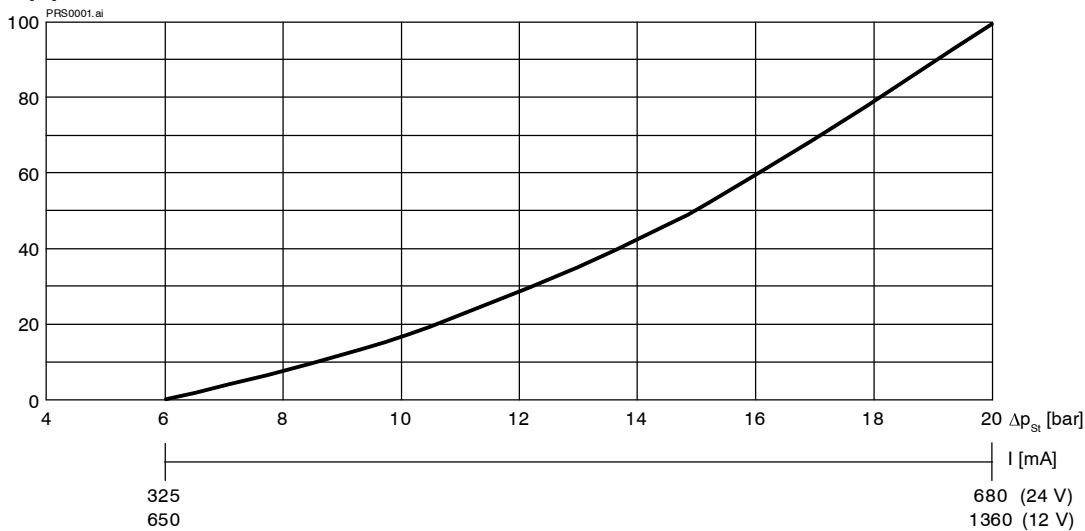
Electrical characteristics	Description, value, unit
Control current at opening point	24 V 325 mA 12 V 650 mA
Control current at max. stroke	24 V 680 mA 12 V 1360 mA
Hysteresis with 100 Hz PWM signal (from control current at max. stroke)	± 3 %
Protection class to EN 60 529	IP 65
Insulation class to VDE 0580	H
Supply voltage	24 V / 12 V
Coil resistance at 20 °C	24 V 21.2 Ω ± 5 % 12 V 5.3 Ω ± 5 %
Coil resistance at 60 °C	24 V 24.5 Ω ± 5 % 12 V 6.1 Ω ± 5 %
Power consumption at max. spool stroke (coil resistance at 60 °C)	10.4 VA
Maximum current for 100 % relative duty cycle with:	24 V 750 mA 12 V 1500 mA

3 Performance graphs

3.1 Control characteristics, electro-hydraulic, proportional

$Q = f(\Delta p_{st})$ Flow rate - Energising signal characteristic

Q [%]



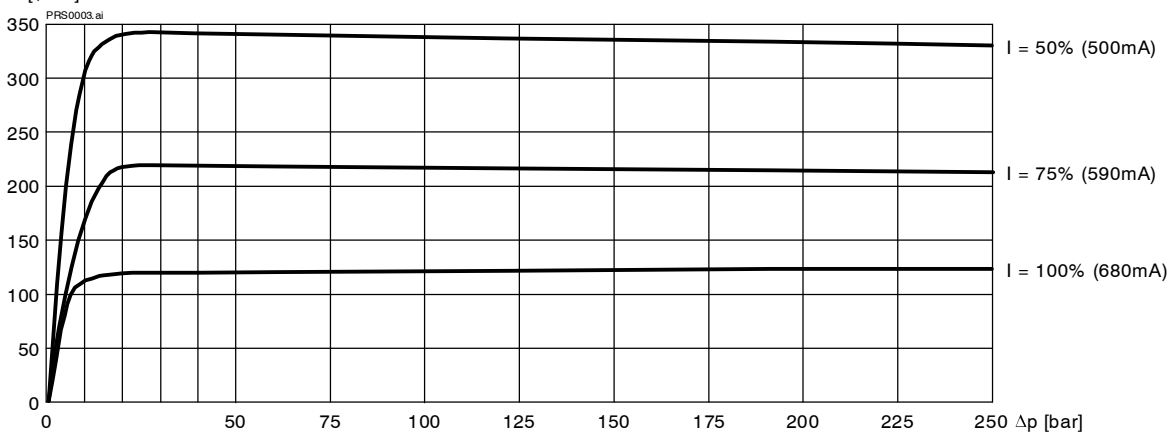
IMPORTANT!

The cross-sectional geometry of the spool and the pressure-differential setting are factory-set so that the valve's working range lies within the characteristic diagram.

3.2 Flow-control characteristics

$Q = f(\Delta p = p_{Pumpe} - p_{Last})$ Flow rate - Pressure differential characteristic

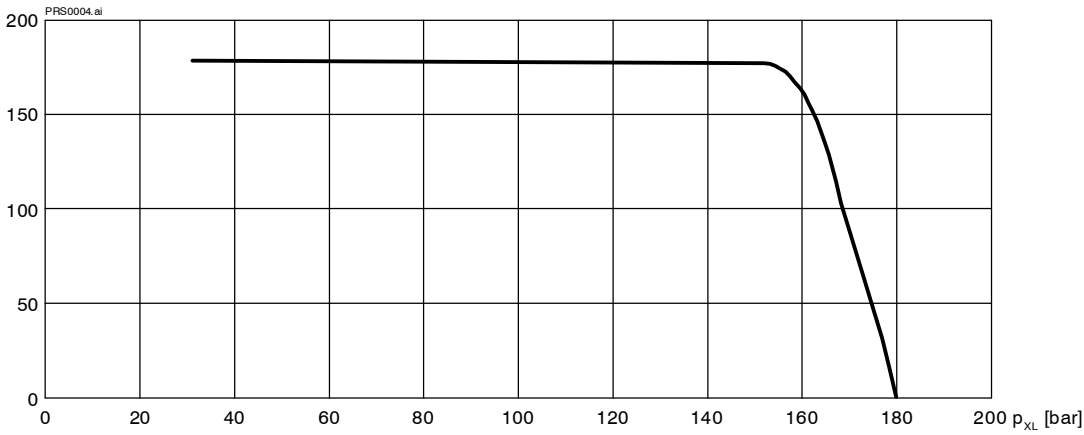
Q [l/min]



3.3 Primary-pressure cut-off

$Q_{A/B} = f(p_{XL})$ Actuator flow rate - Load pressure characteristic

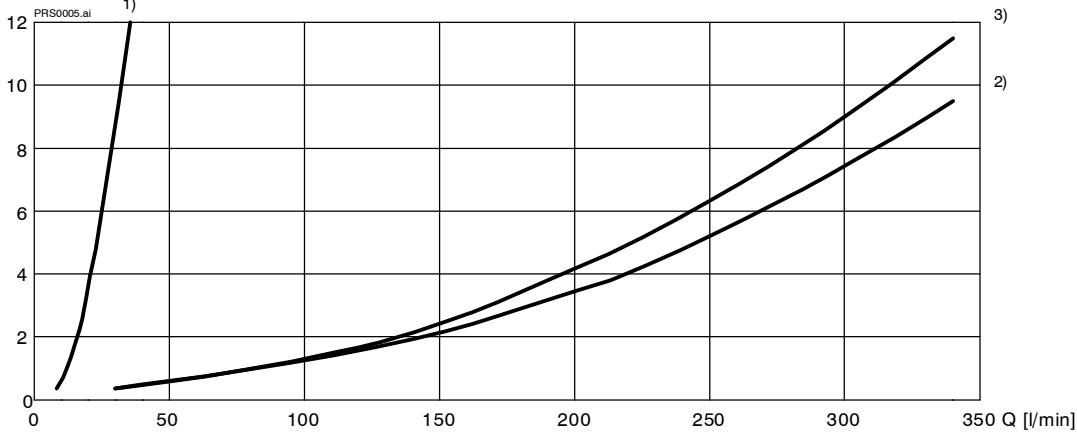
Q [l/min]



3.4 Pressure differential at directional valve spool – Return

$\Delta p_{A/B \rightarrow T} = f(Q_{A/B})$ Pressure differential - Flow rate characteristic

Δp [bar]

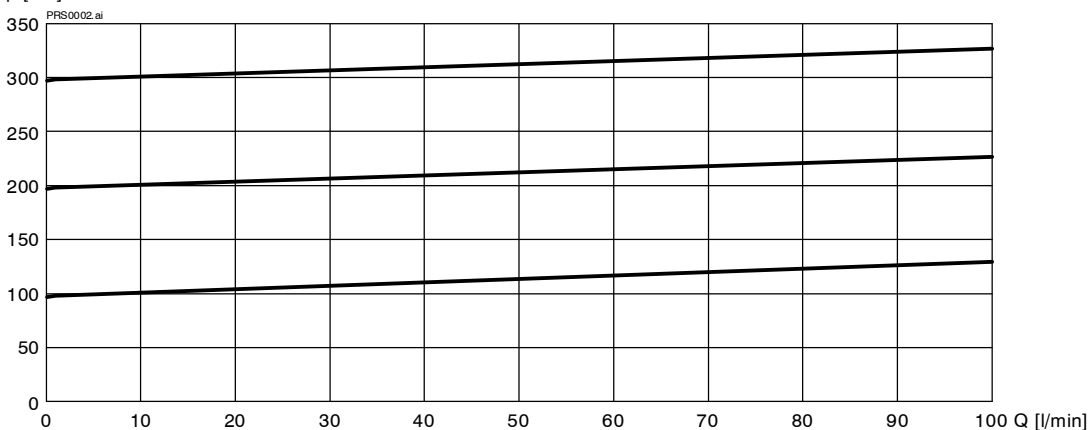


- 1) Spool type C in neutral position
- 2) Spool type C at 100% energisation
- 3) Spool type A at 100% energisation

3.5 Secondary pressure relief (optional)

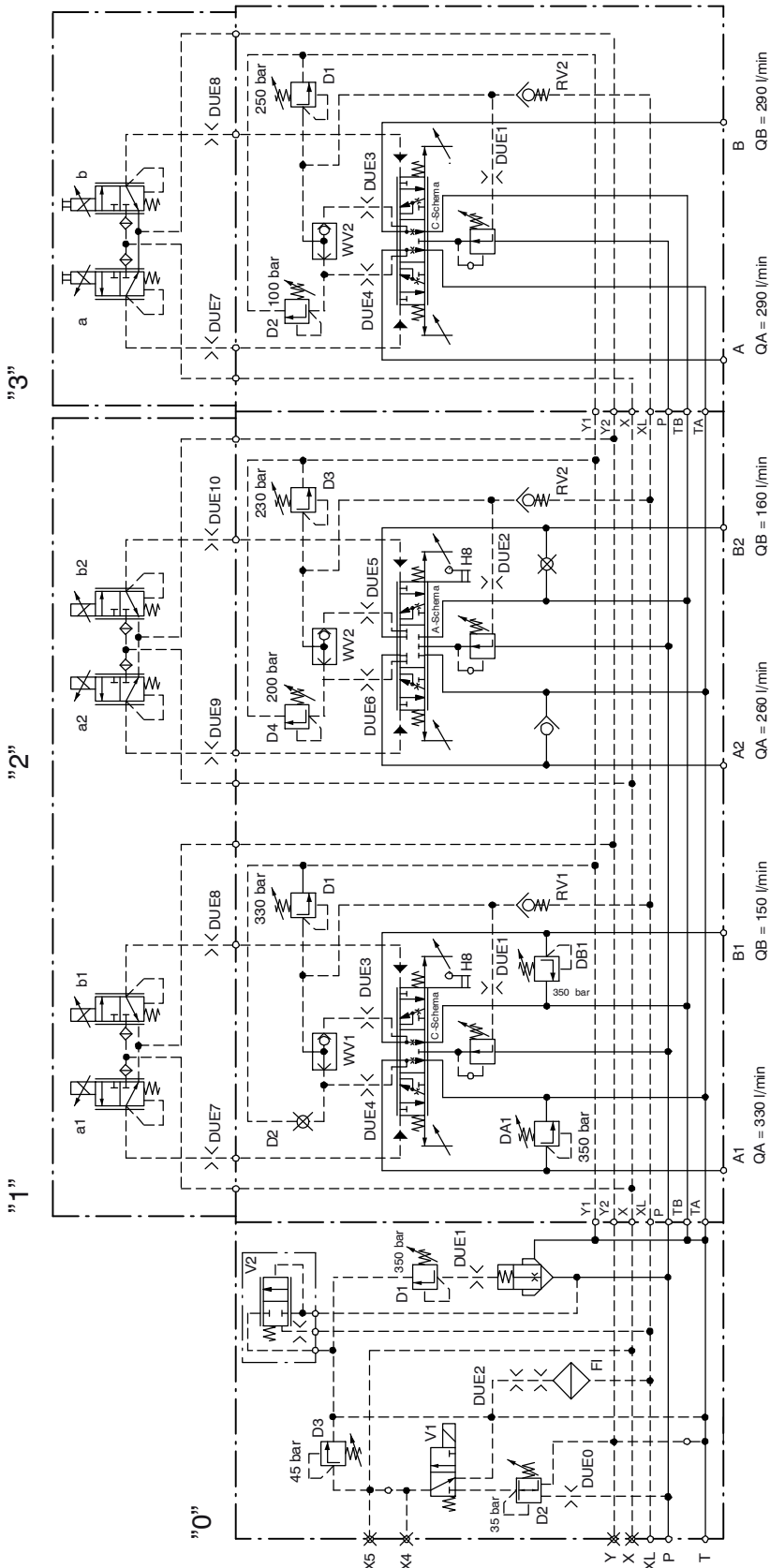
$p_{A/B} - p_T = f(Q_{A/B \rightarrow T})$ Secondary pressure - flow rate characteristic

p [bar]



4 Circuit diagram

Example: proportional valve with one inlet module and two actuator modules with three sections



Bestellbeispiel / Ordering Example

"0" = SC22 - K01 - 111 - 350 - 35 - 45 - A

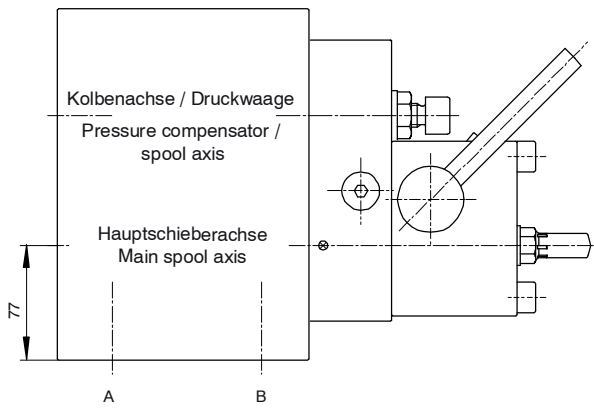
"1" = SC22 - 1 - 1Y10 - 000 / 330 - C350 / 150 - K20 - L01 - D350 / D350 - A

"2" = SC22 - 2 - 2Y10 - 200 / 230 - A260 / 160 - K20 - L01 - N000 / S000 - A

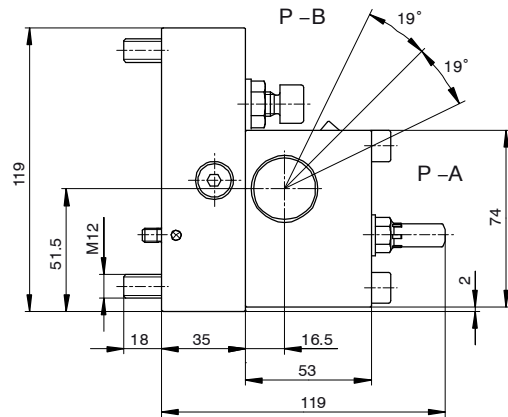
"3" = SC22 - 3 - 0D00 - 100 / 250 - C290 / 290 - E20 - X11 - S000 / S000 - A

5.2 Dimensions, manual operator

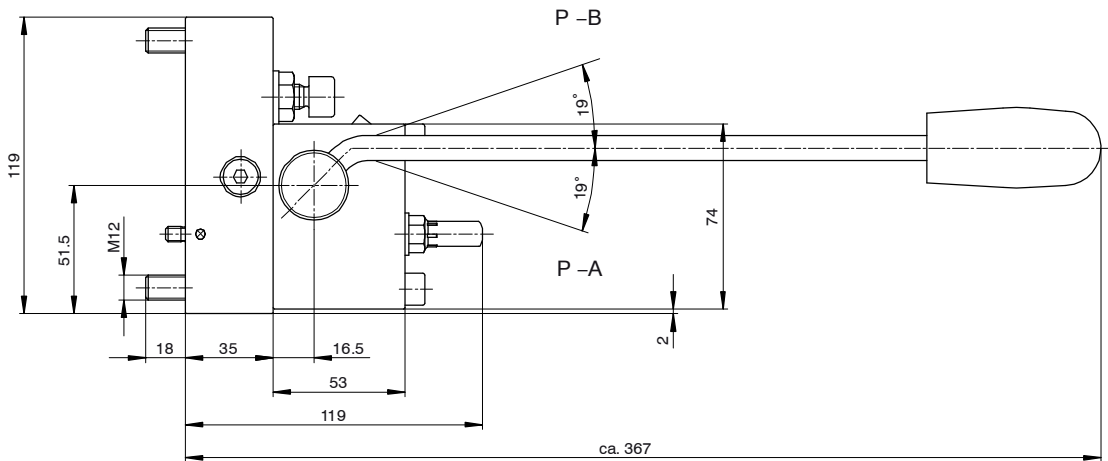
Arrangement on the valve body



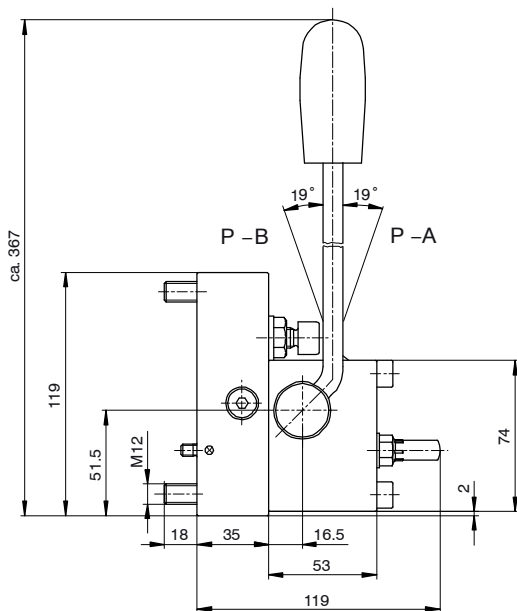
Without hand-lever "Z"



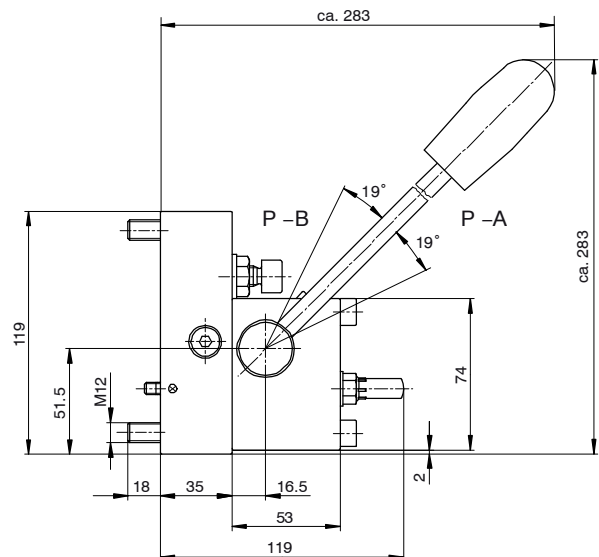
Hand-lever position "A"



Hand-lever position "F"

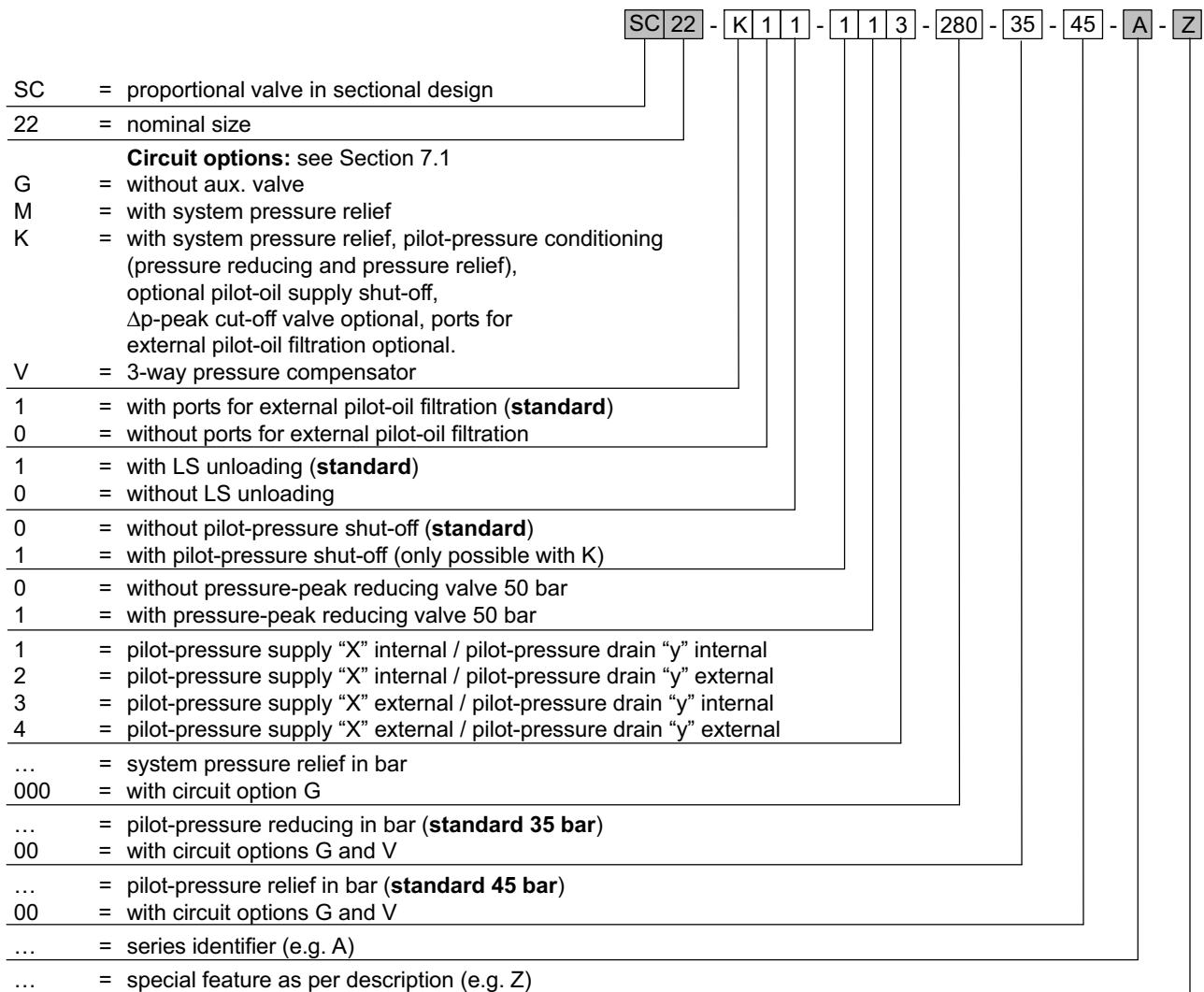


Hand-lever position "L"

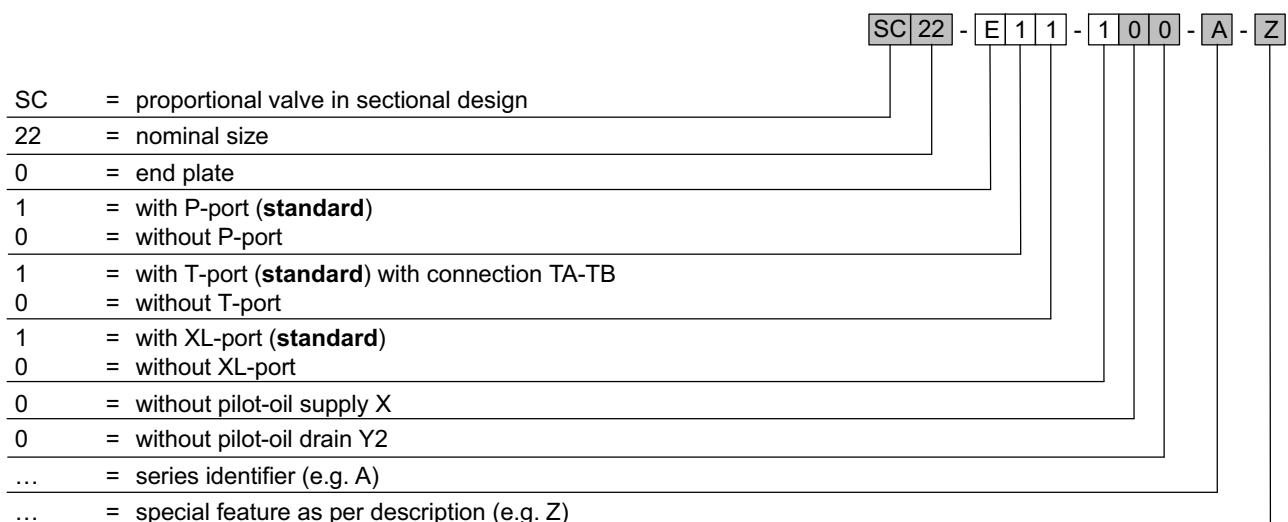


6 Ordering code

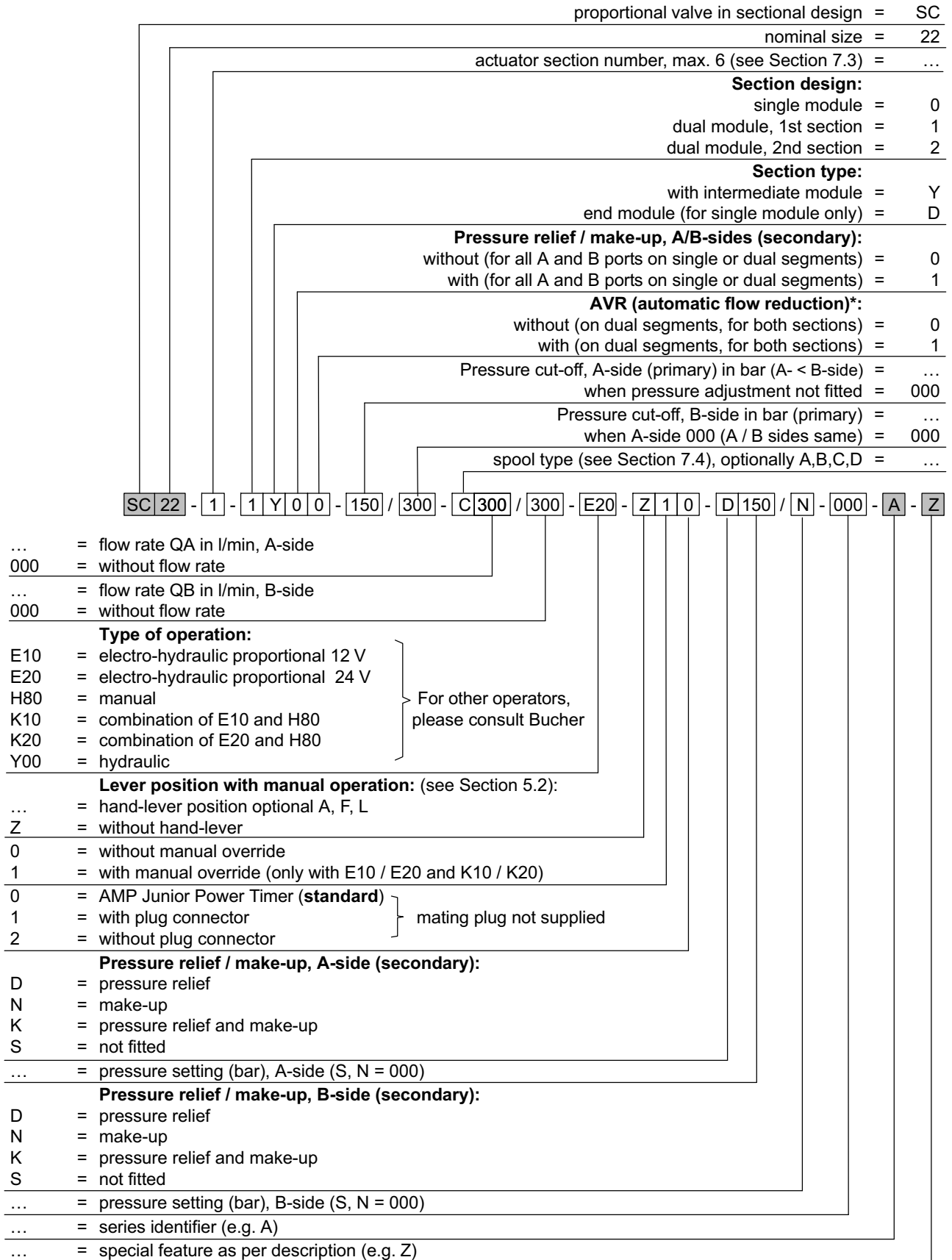
6.1 Inlet module



6.2 End module



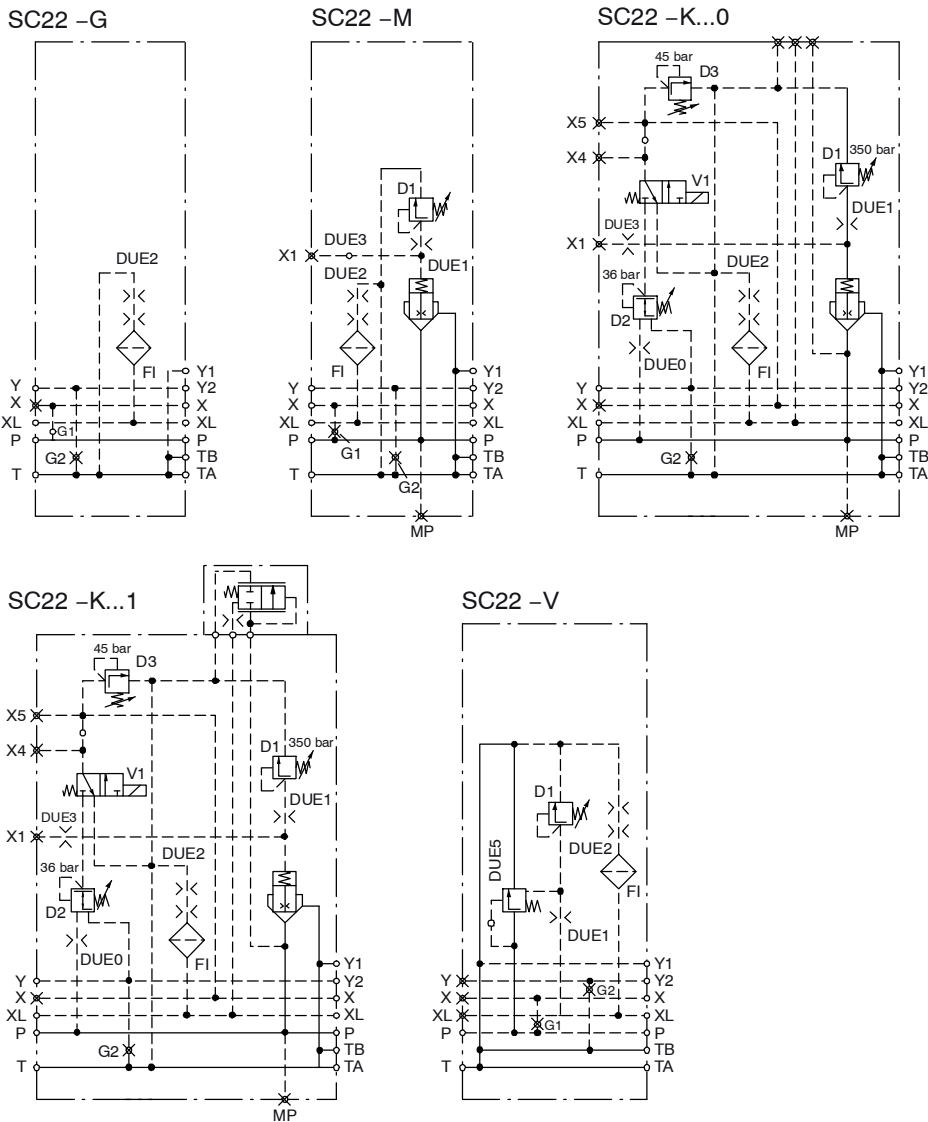
6.3 Actuator module



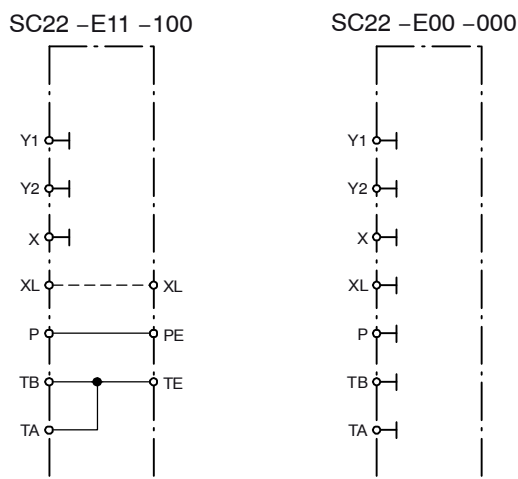
* Consult Bucher / configuration by Technical Sales

7 Modules

7.1 Inlet modules

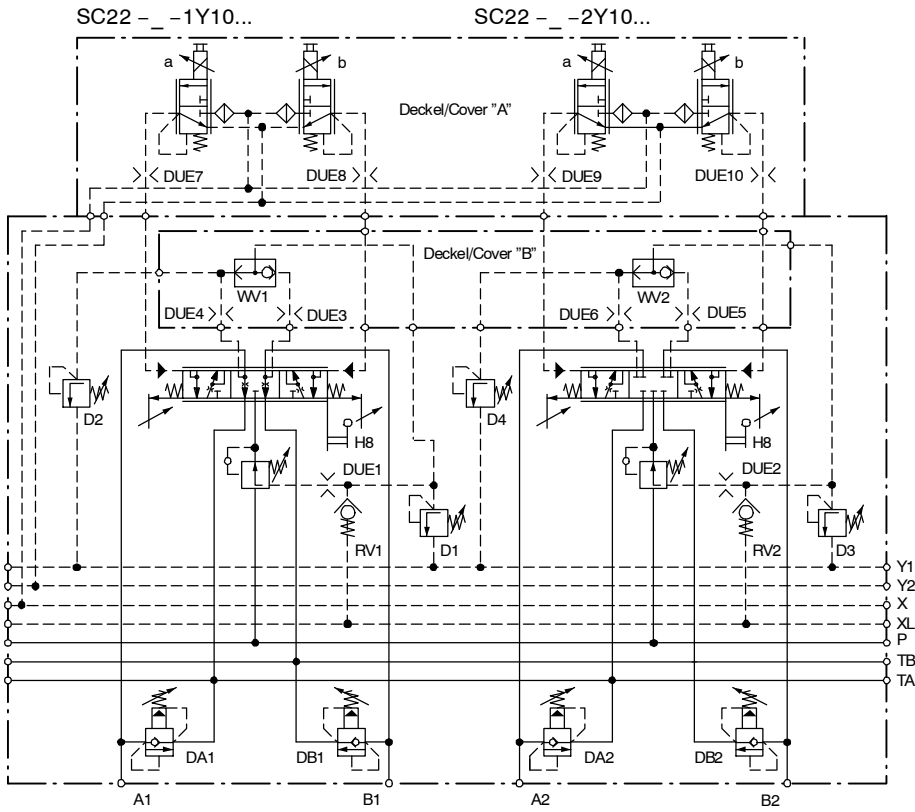


7.2 End module: no actuator section

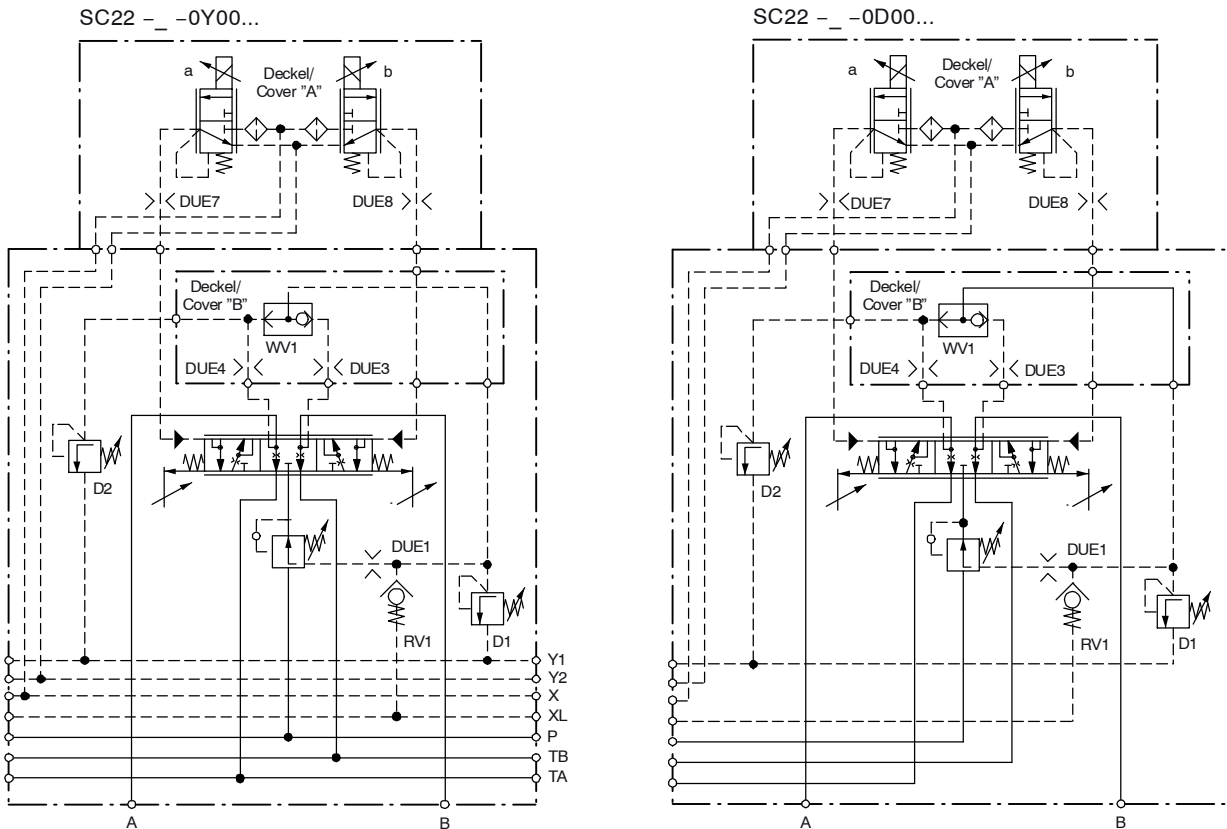


7.3 Actuator modules

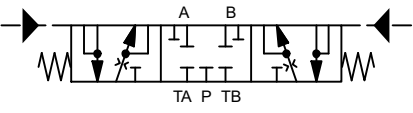
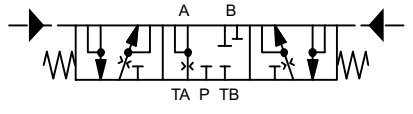
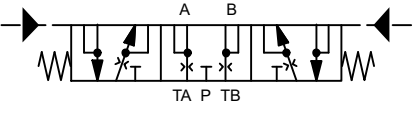
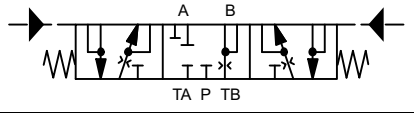
Two actuator sections in one intermediate module



One actuator section as intermediate module or end module



7.4 Spool type / Symbol

5/3 way functions	Description for ordering code
	A
	B
	C
	D

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