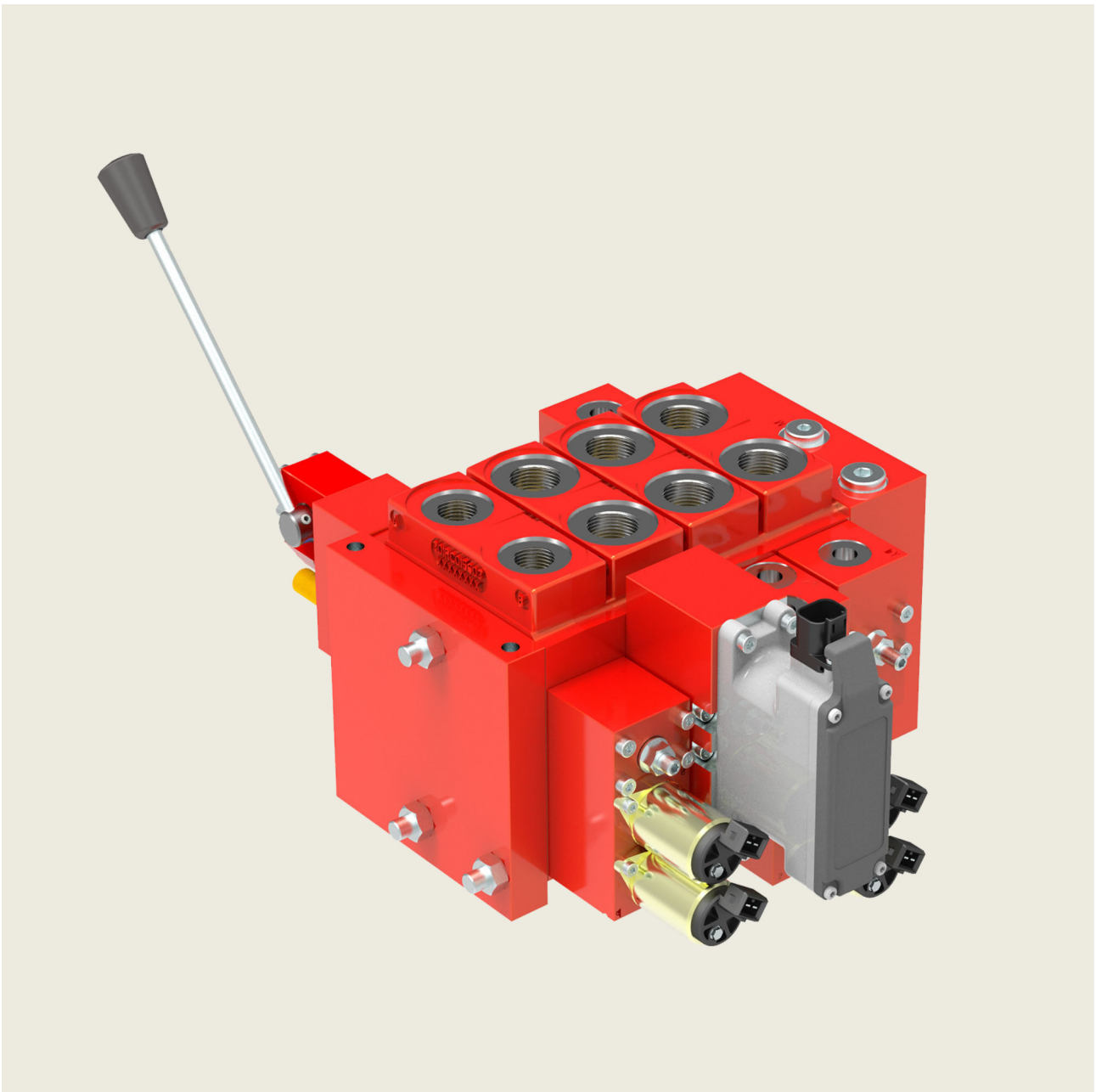


Proportional Directional Valve System

in Sectional Design
Series SC 12



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1 General

1.1 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 (up to eight) and an end module. (> 8 actuator modules on application).

The system is specially designed for use in mobile hydraulics. The user can be assured that the right system is always available for every application.

1.2 Advantages

- Compact sectional design
- Load feedback
- Individual supply cut-off for each actuator port
- Actuator modules with individual pressure compensators and optional primary pressure relief valves
- Load-independent flow control, even with parallel operation of several actuators
- Can be used with fixed displacement pumps and load sensing pumps

1.3 Application examples

- Fire engines
- Mining machines
- Material handlers
- Aerial work access platforms
- Offshore applications
- Forestry machines
- For applications with explosion-protection requirements such as ATEX, IECEx or MSHA, please enquire. For further information, see datasheet 301-P-9050092.

2 Technical data

General characteristics	Unit	Description, value
Design		Proportional valves, sectional design
Type of operation		<ul style="list-style-type: none"> • Electrohydraulic proportional • Electrohydraulic on-off • hydraulic • manual (oil-tight enclosure) • for other types, please contact Bucher
Connection type		Threaded ports as per ISO 1179-Part 1 (Whitworth pipe thread) Threaded ports as per ISO 11926 Part 1 (UNF threads)
Mounting attitude		Unrestricted, but ensure good air-bleeding
Ambient temperature range	°C	-30 ... +60

Hydraulic characteristics	Unit	Description, value
Hydraulic fluid		HL and HLP mineral oil to DIN 51524; for other fluids please contact Bucher Hydraulics
Hydraulic fluid temperature range	°C	-20 ... +80, recommended +20 ... +60
Viscosity range	mm ² /s (cSt)	10 ... 380, recommended 15...250
Minimum fluid cleanliness level		ISO 4406 code 20/18/15
Maximum inlet flow rate	l/min	200

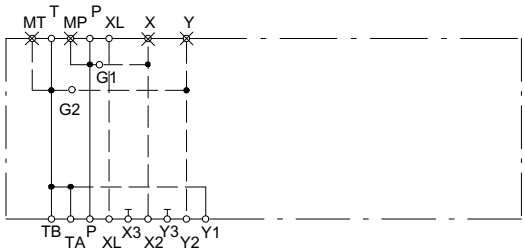
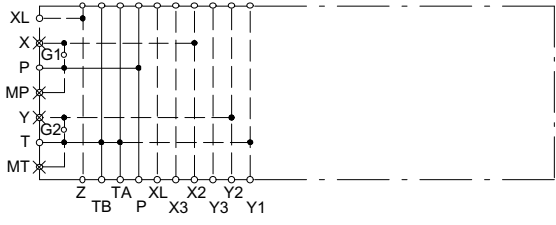
Hydraulic characteristics	Unit	Description, value
Maximum actuator flow rate ($\Delta p_{P-XL} = 13 \text{ bar}$) <ul style="list-style-type: none"> • Pressure compensator with load-holding function • Pressure compensator without load-holding function 	l/min	95 130
Maximum pump pressure	bar	370
Maximum load pressure	bar	420
Maximum tank pressure (port T)	bar	50
Maximum tank pressure for electrohydraulic pilot stage (port Y or T)	bar	5

Hydraulic operation	Unit	Description, value
Pilot-pressure range	bar	6 ... 20
Maximum pressure rating of pilot circuit	bar	50

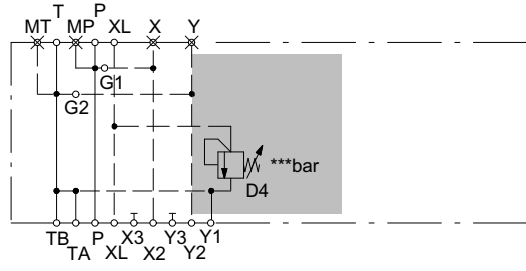
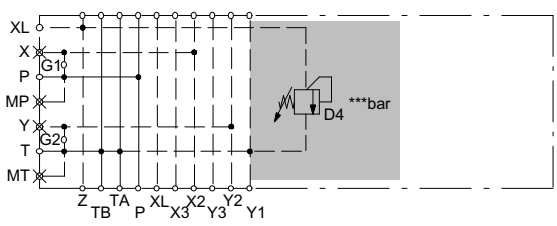
Electrical characteristics
Electrical characteristics see section 7: solenoid valves respectively section 9: sensors

3 Inlet modules

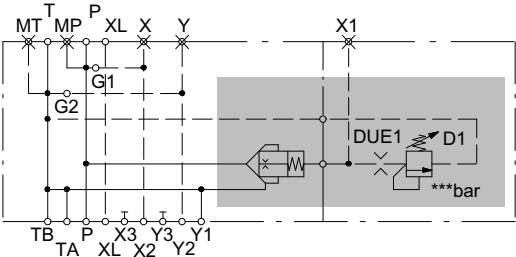
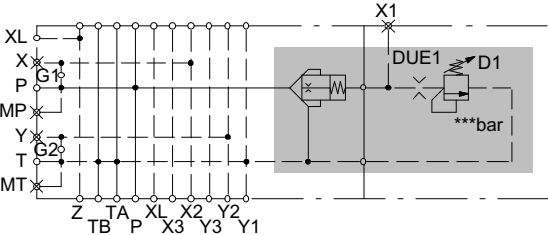
3.1 Module type G: No control function, with port threads

Type and symbol	Description
SC12- GG000 - 000 -...-...- A - V... SC12- GU000 - 000 -...-...- A - V...	
<p style="text-align: center;">Lateral inlet module</p> 	<ul style="list-style-type: none"> without system pressure relief without load-sensing pressure relief <p>Module type:</p> <ul style="list-style-type: none"> G: Lateral inlet module GE: Central inlet module <p>Port thread G:</p> <ul style="list-style-type: none"> P, T = G1" X, XL, Y = G1/4" test point: MP, MT = G1/4"
SC12- GEG000 - 000 -...-...- A - V... SC12- GEU000 - 000 -...-...- A - V...	<p>Port thread U:</p> <ul style="list-style-type: none"> P, T = 1 5/16-12UN X, XL, Y = 9/16-18UNF test point: MP, MT = 9/16-18UNF
<p style="text-align: center;">Central inlet module</p> 	<p>Lateral inlet module SC12-GG..., SC12-GU... only in combination with</p> <ul style="list-style-type: none"> end module (right) <p>Central inlet module SC12-GEG..., SC12-GEU... only in combination with</p> <ul style="list-style-type: none"> end module (right) and end module (left)

3.2 Module type H: Load-sensing pressure relief

Type and symbol	Description
SC12-HG000 - *** -...-...- A - V... SC12-HU000 - *** -...-...- A - V...	
<p style="text-align: center;">Lateral inlet module</p> 	<ul style="list-style-type: none"> without system pressure relief load-sensing pressure relief pressure setting in bar for load-sensing pressure relief (3-digit) <p>Module type:</p> <ul style="list-style-type: none"> H: Lateral inlet module HE: Central inlet module <p>Port thread G:</p> <ul style="list-style-type: none"> P, T = G1" X, XL, Y = G1/4" test point: MP, MT = G1/4"
SC12-HEG000 - *** -...-...- A - V... SC12-HEU000 - *** -...-...- A - V...	
<p style="text-align: center;">Central inlet module</p> 	<p>Port thread U:</p> <ul style="list-style-type: none"> P, T = 1 5/16-12UN X, XL, Y = 9/16-18UNF test point: MP, MT = 9/16-18UNF <p>Lateral inlet module SC12-HG..., SC12-HU... only in combination with</p> <ul style="list-style-type: none"> end module (right) <p>Central inlet module SC12-HEG..., SC12-HEU... only in combination with</p> <ul style="list-style-type: none"> end module (right) and end module (left)

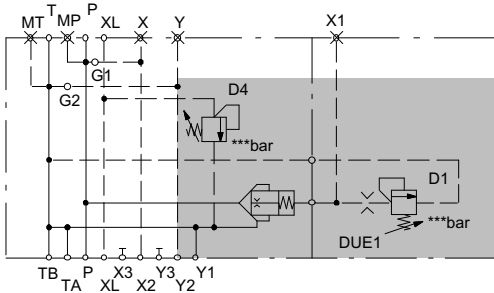
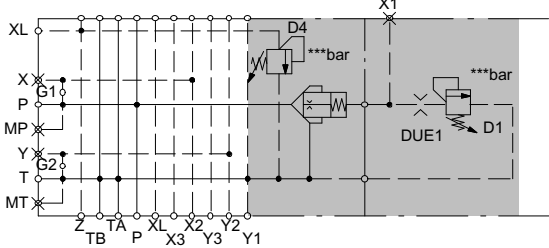
3.3 Module type M: System pressure relief

Type and symbol	Description
SC12-MG***-000 -...- A - V... SC12-MU***-000 -...- A - V...	
<p style="text-align: center;">Lateral inlet module</p> 	<ul style="list-style-type: none"> • system pressure relief • pressure setting in bar for system pressure relief (3-digit) • without load-sensing pressure relief <p>Module type:</p> <ul style="list-style-type: none"> • M: Lateral inlet module • ME: Central inlet module <p>Port thread G:</p> <ul style="list-style-type: none"> • P, T = G1" • X, XL, Y = 1/4" • test point: MP, MT = G1/4"
SC12-MEG***-000 -...- A - V... SC12-MEU***-000 -...- A - V...	
<p style="text-align: center;">Central inlet module</p> 	<p>Port thread U:</p> <ul style="list-style-type: none"> • P, T = 1 5/16-12UN • X, XL, Y = 9/16-18UNF • test point: MP, MT = 9/16-18UNF <p>Lateral inlet module SC12-MG..., SC12-MU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) <p>Central inlet module SC12-MEG..., SC12-MEU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) and • end module (left)

IMPORTANT!

The setting of the system pressure relief in the inlet module must be 20 bar higher than the highest value of the primary-pressure cut-off in the actuator modules.

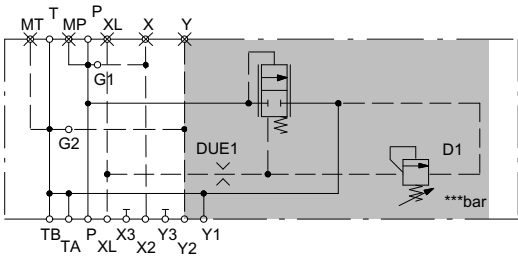
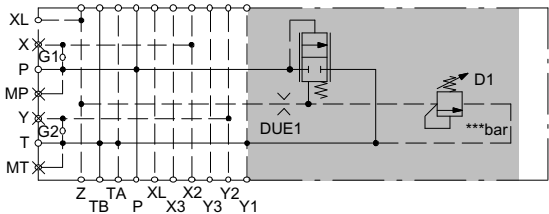
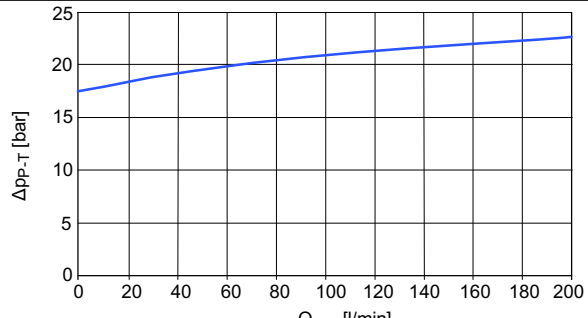
3.4 Module type N: System pressure relief and load-sensing pressure relief

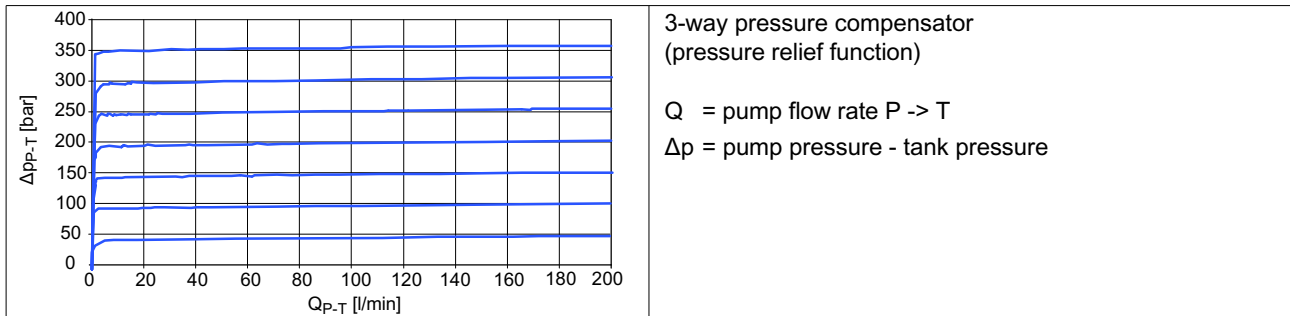
Type and symbol	Description
SC12-NG***-***-...-...- A - V... SC12-NU***-***-...-...- A - V...	
<p style="text-align: center;">Lateral inlet module</p> 	<ul style="list-style-type: none"> • system pressure relief • pressure setting in bar for system pressure relief (3-digit) • load-sensing pressure relief • pressure setting in bar for load-sensing pressure relief (3-digit) <p>Module type:</p> <ul style="list-style-type: none"> • N: Lateral inlet module • NE: Central inlet module <p>Port thread G:</p> <ul style="list-style-type: none"> • P, T = G1" • X, XL, Y = G1/4" <p>test point:</p> <ul style="list-style-type: none"> • MP, MT = G1/4"
SC12-NEG***-***-...-...- A - V... SC12-NEU***-***-...-...- A - V...	
<p style="text-align: center;">Central inlet module</p> 	<p>Port thread U:</p> <ul style="list-style-type: none"> • P, T = 1 5/16-12UN • X, XL, Y = 9/16-18UNF <p>test point:</p> <ul style="list-style-type: none"> • MP, MT = 9/16-18UNF <p>Lateral inlet module SC12-NG..., SC12-NU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) <p>Central inlet module SC12-NEG..., SC12-NEU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) and • end module (left)

IMPORTANT!

The setting of the system pressure relief must be 20 bar higher than the highest value of the load-sensing pressure relief units.

3.5 Module type V: 3-way-pressure compensator with system pressure relief

Type and symbol and characteristic curves	Description
SC12-VG***-000 -...- A - V... SC12-VU***-000 -...- A - V...	
<p style="text-align: center;">Lateral inlet module</p> 	<ul style="list-style-type: none"> • 3-way-pressure compensator with system pressure relief • pressure setting in bar for system pressure relief (3- digit) <p>Module type:</p> <ul style="list-style-type: none"> • V: Lateral inlet module • VE: Central inlet module <p>Port thread G:</p> <ul style="list-style-type: none"> • P, T = G1" • X, XL, Y = G1/4" • test point: MP, MT = G1/4"
SC12-VEG***-000 -...- A - V... SC12-VEU***-000 -...- A - V...	
<p style="text-align: center;">Central inlet module</p> 	<p>Port thread U:</p> <ul style="list-style-type: none"> • P, T = 1 5/16-12UN • X, XL, Y = 9/16-18UNF • test point: MP, MT = 9/16-18UNF <p>Lateral inlet module SC12-VG..., SC12-VU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) <p>Central inlet module SC12-VEG..., SC12-VEU... only in combination with</p> <ul style="list-style-type: none"> • end module (right) and • end module (left)
	<p>3-way pressure compensator (control curve)</p> <p>Q = pump flow rate P -> T Δp = pump pressure - tank pressure</p>



IMPORTANT!

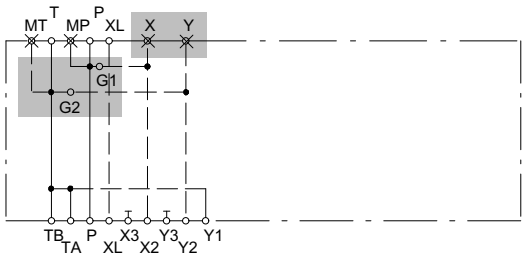
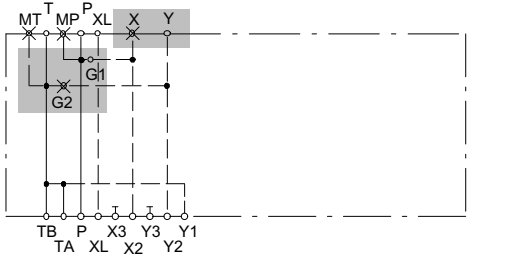
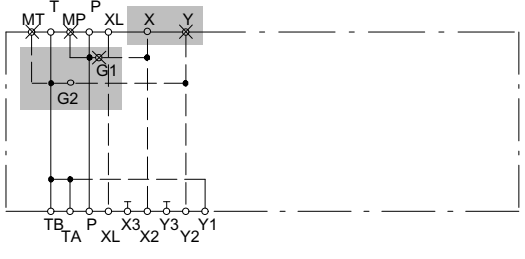
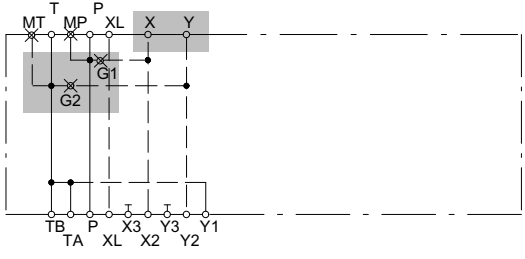
The setting of the system pressure relief in the inlet module must be 20 bar higher than the highest value of the primary-pressure cut-off in the actuator modules.

3.6 Pilot-pressure conditioning

3.6.1 With pilot-pressure conditioning

Type and symbol	Description
<p>SC12-...-...- 001 - 3546 - A - V...</p>	<ul style="list-style-type: none"> pilot oil supply: internal pilot oil unloading: internal pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> X2 = G1/4" : plugged Y = G1/4" : plugged <p>Port thread U:</p> <ul style="list-style-type: none"> X2 = 9/16-18UNF: plugged Y = 9/16-18UNF: plugged
<p>SC12-...-...- 011 - 3546 - A - V...</p>	<ul style="list-style-type: none"> pilot oil supply: internal pilot oil unloading: external pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> X2 = G1/4" : plugged Y = G1/4" : open <p>Port thread U:</p> <ul style="list-style-type: none"> X2 = 9/16-18UNF: plugged Y = 9/16-18UNF: open

3.6.2 Without pilot-pressure conditioning

Type and symbol	Description
<p>SC12-...-...- 000 - 0000 - A - V...</p> 	<ul style="list-style-type: none"> • pilot oil supply: internal • pilot oil unloading: internal • without pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> • X = G1/4" : plugged • Y = G1/4" : plugged <p>Port thread U:</p> <ul style="list-style-type: none"> • X = 9/16-18UNF: plugged • Y = 9/16-18UNF: plugged
<p>SC12-...-...- -010 - 0000 - A - V...</p> 	<ul style="list-style-type: none"> • pilot oil supply: internal • pilot oil unloading : external • without pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> • X = G1/4" : plugged • Y = G1/4" : open <p>Port thread U:</p> <ul style="list-style-type: none"> • X = 9/16-18UNF: plugged • Y = 9/16-18UNF: open
<p>SC12-...-...- 100 - 0000 - A - V...</p> 	<ul style="list-style-type: none"> • pilot oil supply: external • pilot oil unloading: internal • without pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> • X = G1/4" : open • Y = G1/4" : plugged <p>Port thread U:</p> <ul style="list-style-type: none"> • X = 9/16-18UNF: open • Y = 9/16-18UNF: plugged
<p>SC12-...-...- 110 - 0000 - A - V...</p> 	<ul style="list-style-type: none"> • pilot oil supply: external • pilot oil unloading: external • without pilot-pressure conditioning <p>Port thread G:</p> <ul style="list-style-type: none"> • X = G1/4" : open • Y = G1/4" : open <p>Port thread G:</p> <ul style="list-style-type: none"> • X = G1/4" : open • Y = G1/4" : open

3.7 Options

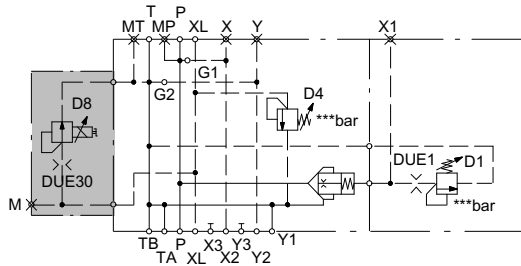
3.7.1 Version: Standard

Type and symbol	Description
SC12-.....-A - V 0 T...	
	<ul style="list-style-type: none"> • standard

3.7.2 Modules for the chain of shuttle valves for load sensing

Type and symbol	Description
SC12-.....-A - V 2 T... - V 5= ***	
	<ul style="list-style-type: none"> • pressure-peak reduction • pressure setting in bar for pressure-peak reduction (3-digit) (V5= ...)
SC12-.....-A - V 5 T...	
	<ul style="list-style-type: none"> • electroproportional pressure relief with falling characteristic curve (for further information, see sec. 7: Solenoid valves) • pressure range: 350 bar • voltage: 24 V • current: DC • mating plug to ISO 4400 / DIN 43650 (standard, IP65) • characteristic curve see Sect. 7: Solenoid valves <p>Port thread G:</p> <ul style="list-style-type: none"> • test point: M = G1/4" <p>Port thread U:</p> <ul style="list-style-type: none"> • test point: M = 9/16-18UNF <p>Caution: Max. pressure in the load sensing system: 350 bar.</p>

SC12-.....-A - V 6 T...



- electroproportional pressure relief with rising characteristic curve (for further information, see Sec. 7: Solenoid valves)
- pressure range: 350 bar
- voltage: 24 V
- current: DC
- mating plug to ISO 4400 / DIN 43650 (standard, IP65)
- characteristic curve see sect. 7: Solenoid valves

Port thread G:

- test point: M = G1/4"

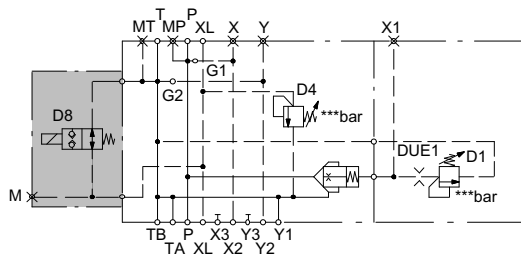
Port thread U:

- test point: M = 9/16-18UNF

Caution:

Max. pressure in the load sensing system: 350 bar.

SC12-.....-A - V 8 T...



- relieving the load signal with 2/2 directional valve (de-energized open) (for further information, see Sec. 7: Solenoid valves)
- voltage: 24 V
- current: DC
- mating plug to ISO 4400 / DIN 43650 (standard, IP65)

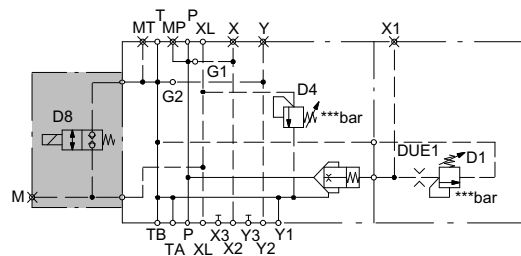
Portn thread G:

- test point: M = G1/4"

Port thread U:

- test point: M = 9/16-18UNF

SC12-.....-A - V 9 T...



- relieving the load signal with 2/2-directional valve (de-energized closed) (for further information, see Sec. 7: Solenoid valves)
- voltage: 24 V
- current: DC
- mating plug to ISO 4400 / DIN 43650 (standard, IP65)

Port thread G:

- test point: M = G1/4"

Port thread U:

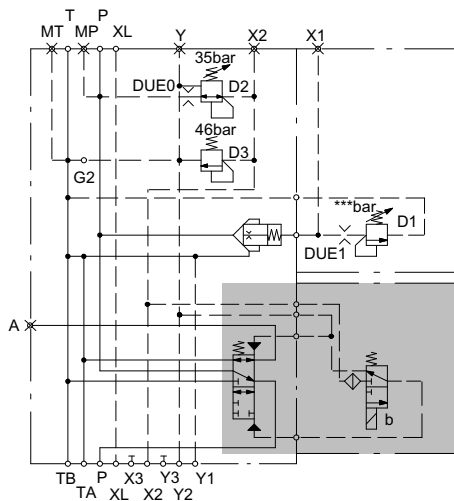
- test point: M = 9/16-18UNF

SC12-.....-A-V 10 T...	
	<ul style="list-style-type: none"> • 3/2 directional valve (for further information, see Sec. 7: Solenoid valves) • voltage: 24 V • current: DC • mating plug to ISO 4400 / DIN 43650 (standard, IP65) <p>Port thread G:</p> <ul style="list-style-type: none"> • XL5 = G1/4": open <p>Port thread U:</p> <ul style="list-style-type: none"> • XL5 = 9/16-18UNF: open
SC12-.....-A-V 11 T...	
	<ul style="list-style-type: none"> • blanking plate
SC12-.....-A-V 12 T...-D 8 =***	
	<ul style="list-style-type: none"> • switchable 2nd relief valve for load-sensing • pressure setting in bar for 2nd load-sensing pressure relief (3-digit) (D8=...) • 2/2 directional valve (de-energised shut-off) (for further information, see Sec. 7: Solenoid valves) • voltage: 24 V • current: DC • mating plug to ISO 4400 / DIN 43650 (standard, IP65)

3.7.3 Module for pilot oil supply

Type and symbol	Description
SC12-.....-A-V 1 T...	
	<ul style="list-style-type: none"> • pilot pressure shut-off • 3/2 directional valve (de-energised closed) (for further information, see Sec. 7: Solenoid valves) • voltage: 24 V • current: DC • mating plug to ISO 4400 / DIN 43650 (standard, IP65) <p>Port thread G:</p> <ul style="list-style-type: none"> • S = G3/8": plugged <p>Port thread U:</p> <ul style="list-style-type: none"> • S = 3/4-16UNF: plugged

SC12-.....- A - V 19 T...



- switchable pump-line connection (de-energized open)
- 2 switched positions
- operation: electrohydraulic on-off (for further information, see Sec. 7: Solenoid valves)
- voltage: 24 V
- current: DC
- connection type (solenoid): AMP Junior Timer 2-pole
- solenoid valve without manual override

Port thread G:

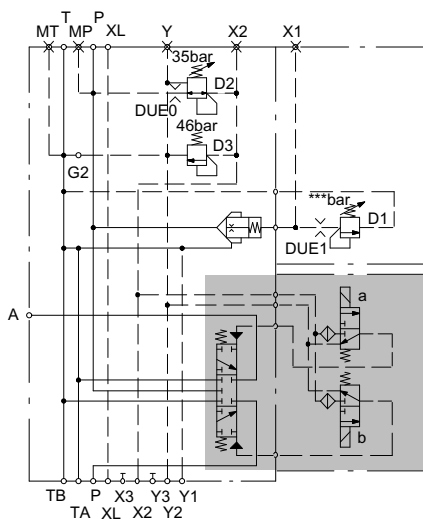
- A = G1": plugged

Port thread U:

- A = 1 5/16-12UN: plugged

For other types of operators, contact Bucher Hydraulics

SC12-.....- A - V 25 T...



- switchable pump-line connection (de-energized shut-off)
- 3 switched positions
- operation: electrohydraulic on-off (for further information, see Sec. 7: Solenoid valves)
- voltage: 24 V
- current: DC
- connection type (solenoid): AMP Junior Timer 2-pole
- solenoid valve without manual override

Port thread G:

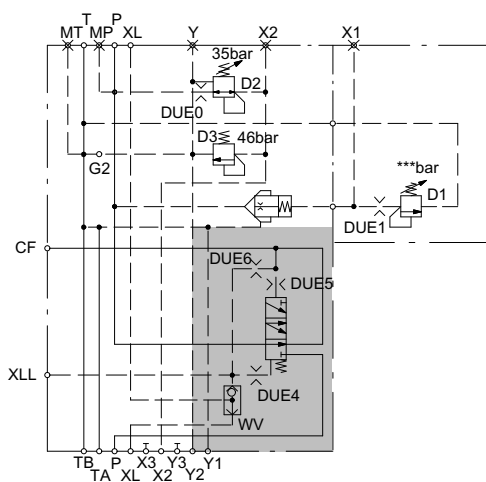
- A = G1": open

Port thread U:

- A = 1 5/16-12UN: open

For other types of operators, contact Bucher Hydraulics

SC12-.....- A - V 33 T...



- priority valve (priority flow: external) (surplus flow: internal)
- priority flow rate at port CF (flow rate max. $Q_{CF} = 70$ l/min)
- dynamic load sensing

Port thread G:

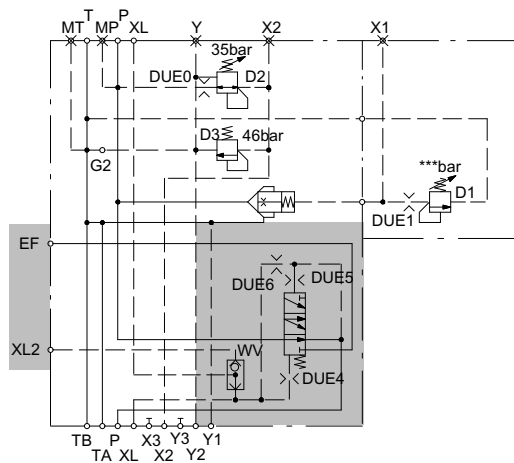
- CF = G1/2": open
- XLL = G1/4": open

Port thread U:

- CF = 7/8-14UNF: open
- XLL = 9/16-18UNF: open

For static load sensing, please inquire.

SC12-...-...-...- A - V 35 T...



- priority valve (priority flow: internal) (surplus flow: external)
- priority flow at port EF
- dynamic load sensing

Port thread G:

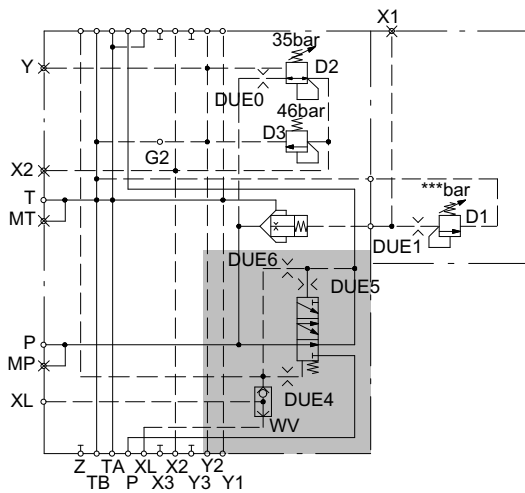
- EF = G1": open
- XL2 = G1/4": open

Port thread U:

- EF = 1 5/16-12UNF: open
- XL2 = 9/16-18UNF: open

For static load sensing, please inquire

SC12- E -...-...-...- A - V 37 T...



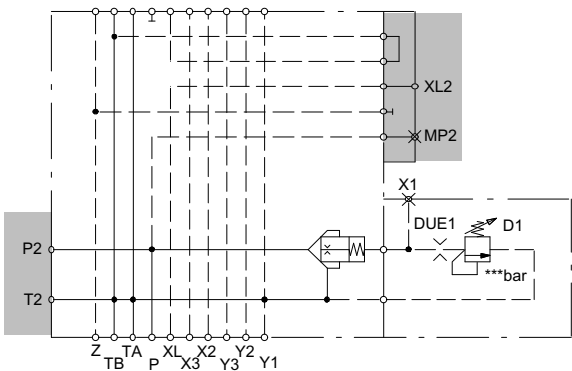
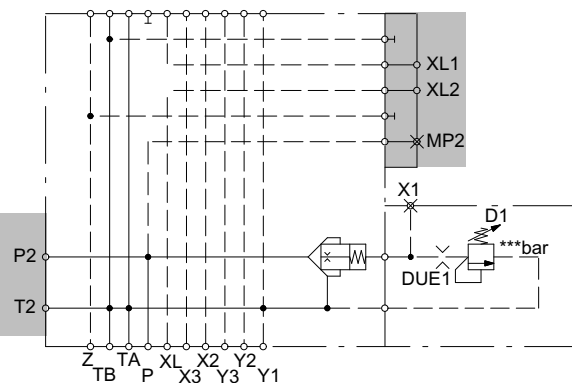
- priority valve (priority flow: internal) (surplus flow: internal)
- dynamic load sensing

Module type:

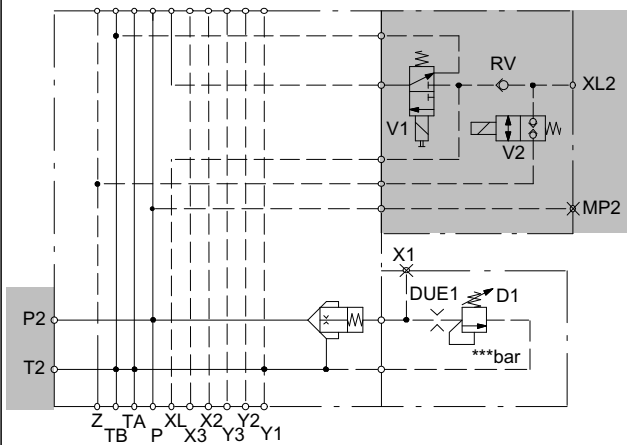
- central inlet module (one-pump circuit) GE, HE, ME, NE, VE
- XLL = G1/4": open

For static load sensing, please inquire

3.7.5 Module for two-pump circuits

Type and symbol	Description
<p data-bbox="188 331 608 360">SC12- <u>Z</u> _ _ _ _ -...-770-...- A - V 31 T...</p> 	<ul data-bbox="834 376 1286 577" style="list-style-type: none"> • pump line is shut-off • tank line is continuous • pilot oil supply is external (without connection port in the module) • load sensing line is shut off • upstream load signal unloaded to tank <p data-bbox="834 607 975 636">Module type:</p> <ul data-bbox="834 645 1286 696" style="list-style-type: none"> • central inlet module (two-pump circuits) GZ, HZ, MZ, NZ, VZ <p data-bbox="834 728 986 757">Port thread G:</p> <ul data-bbox="834 766 1066 891" style="list-style-type: none"> • P2, T2 = G1" • XL2 = G1/4" • test point: MP2 = G1/4" <p data-bbox="834 922 986 952">Port thread U:</p> <ul data-bbox="834 960 1142 1086" style="list-style-type: none"> • P2, T2 = 1 5/16-12UN • XL2 = 9/16-18UNF • test point: MP2 = 9/16-18UNF
<p data-bbox="188 1095 608 1124">SC12- <u>Z</u> _ _ _ _ -...-770-...- A - V 32 T...</p> 	<ul data-bbox="834 1140 1358 1341" style="list-style-type: none"> • pump line is shut-of • tank line is continuous • pilot-oil supply is external (without connection port in the module) • load sensing line is shut off • upstream load signal connected with port XL1 <p data-bbox="834 1373 975 1402">Module type:</p> <ul data-bbox="834 1411 1286 1462" style="list-style-type: none"> • central inlet module (two-pump circuits) GZ, HZ, MZ, NZ, VZ <p data-bbox="834 1494 986 1523">Port thread G:</p> <ul data-bbox="834 1532 1066 1657" style="list-style-type: none"> • P2, T2 = G1" • XL1, XL2 = G1/4" • test point: MP2 = G1/4" <p data-bbox="834 1688 986 1718">Port thread U:</p> <ul data-bbox="834 1727 1142 1852" style="list-style-type: none"> • P2, T2 = 1 5/16-12UN • XL1, XL2 = 9/16-18UNF • test point: MP2 = 9/16-18UNF <p data-bbox="834 1883 1406 1964">Caution: To unload the load sensing signal via port XL1, external means must be used.</p>

SC12- **Z** -...-770-...-A - V 24 T...



- pump line is continuous
- tank line is continuous
- pilot-oil supply is external (without connection port in the module)
- switchable load-sensing line connection (de-energized shut-off) (For further informations, see Section 7: Solenoid valves))
- voltage: 24 V
- current: DC
- mating plug to ISO 4400 / DIN 43650 (standard, IP65)

Module type:

- central inlet module (two-pump circuits)
GZ, HZ, MZ, NZ, VZ

Port thread G:

- P2, T2 = G1"
- XL2 = G1/4"
- test point:
MP2 = G1/4"

Port thread U:

- P2, T2 = 1 5/16-12UN
- XL2 = 9/16-18UNF
- test point:
MP2 = 9/16-18UNF

Inlet module SC12- **Z**...

only in combination with

- central inlet module
SC12- **E**...-A-V18T...

3.8 Ordering code

3.8.1 Ordering code for inlet section, Part 1

SC 12 - N G 370 - 250 -

SC	Valve series
12	Nominal size
G, GE, GZ	Module option without system pressure relief without load-sensing pressure relief
H, HE, HZ	without system pressure relief with load-sensing pressure relief
M, ME, MZ	system pressure relief without load-sensing pressure relief
N, NE, NZ	system pressure relief with load-sensing pressure relief
V, VE, VZ	3-way-pressure compensator with system pressure relief
	Type of module lateral inlet module: G, H, M, N, V central inlet module: (one-pump circuit): GE, HE, ME, NE, VE central inlet module (two-pump circuits): GZ, HZ, MZ, NZ, VZ
G	Connection type thread (ISO 1179 Part 1 Whitworth pipe thread)
U	thread (ISO 11926 Part 1 UNF-thread)
000	System pressure relief [bar] with module option G, GE, GZ, H, HE and HZ
370	specify required setting (example 370 bar)
000	Load-sensing pressure relief [bar] with module option G, GE, GZ, M, ME, MZ, V, VE and VZ
250	specify required setting (example 250 bar)

3.8.2 Ordering code for inlet section, Part 2

- 1 0 1 - 35 46 - A - V0 T1

Pilot oil supply	
0	internal: port X or X2: plugged (section type G, GE, H, HE, M, ME, N, NE, V and VE)
1	external: port X or X2: open (section type G, GE, H, HE, M, ME, N, NE, V and VE)
7	- (section type GZ, HZ, MZ, NZ and VZ)
Pilot oil unloading	
0	internal: port Y: plugged< (section type G, GE, H, HE, M, ME, N, NE, V and VE)
1	external: port Y: open (section type GZ, HZ, MZ, NZ and VZ)
7	- (section type GZ, HZ, MZ, NZ and VZ)
Pilot-pressure conditioning	
0	without
1	with (section type G, GE, H, HE, M, ME, N, NE, V and VE)
Pilot pressure reducing [bar] data specified by Bucher Hydraulics	
Pilot pressure limitation [bar] data specified by Bucher Hydraulics	
Series Identifier data specified by Bucher Hydraulics	
Option ... for available options, see section 3.8.3	
Variants of nameplate	
T1	Version: Standard (customised versions on application)

3.8.3 Options

- V0 Version: standard
- V1 Pilot pressure shut-off
- V2 Pressure-peak reduction
- V5 Electroproportional pressure relief with falling characteristic curve
- V6 Electroproportional pressure relief with rising characteristic curve
- V8 LS unloading with 2/2 directional valve (normally open)
- V9 LS unloading with 2/2 directional valve (normally closed)
- V10 3/2 directional valve
- V11 Blanking plate
- V12 Switchable 2nd relief valve for load-sensing
- V13 Switchable pump-line connection (de-energized shut-off), 2 switched positions, operation type: electrohydraulic on/off
- V18 Switchable pump-line connection for downstream modules (de-energized shut-off), 2 switched positions, operation type: electrohydraulic on/off
- V19 Switchable pump-line connection (de-energized open), 2 switched positions, operation type: electrohydraulic on/off
- V24 Pump line continuous, tank line continuous, switchable load-sensing line connection (de-energized shut-off) operation type: electrohydraulic on/off
- V25 Switchable pump-line connection (de-energised shut-off), 3 switched positions, operation type: electrohydraulic on/off
- V31 Pump line shut off, tank line continuous, load sensing line shut off, upstream load signal unloaded to tank
- V32 Pump line shut off, tank line continuous, load sensing line shut off, upstream load signal connected to port XL1.
- V33 Priority valve (priority flow: external; surplus flow: internal)
- V35 Priority valve (priority flow: internal; surplus flow: external)
- V37 Priority valve (priority flow: internal; surplus flow: internal)

3.9 Dimensions

3.9.1 Dimensions SC12-G... and SC12-H...

Type and dimensions	Type and dimensions
SC12- GG _ _ _ _ _ 0 _ _ _ _ A - V 0	SC12- GG _ _ _ _ _ 1 _ _ _ _ A - V 0
SC12- GU _ _ _ _ _ 0 _ _ _ _ A - V 0	SC12- GU _ _ _ _ _ 1 _ _ _ _ A - V 0
SC12- HG _ _ _ _ _ 0 _ _ _ _ A - V 0	SC12- HG _ _ _ _ _ 1 _ _ _ _ A - V 0
SC12- HU _ _ _ _ _ 0 _ _ _ _ A - V 0	SC12- HU _ _ _ _ _ 1 _ _ _ _ A - V 0

3.9.1.1 Port sizes

Port	ISO 1179 Part 1	ISO 11926 Part 1
P Pump	G1"	1 5/16-12UN
T Tank	G1"	1 5/16-12UN
X, X2 Pilot oil supply	G1/4"	9/16-18UNF
XL Load sensing	G1/4"	9/16-18UNF
Y Pilot oil unloading	G1/4"	9/16-18UNF
MP Test point, pump	G1/4"	9/16-18UNF
MT Test point, tank	G1/4"	9/16-18UNF

3.9.1.2 Mounting thread

Ordering code	Mounting	
	D1	Depth
SC12- G _ _ _ _ _ A - V 0	M10	17
SC12- U _ _ _ _ _ A - V 0	3/8-16UNC	16

3.9.2 Dimensions SC12-M... and SC12-N...

Type and dimensions	Type and dimensions
SC12- MG -...- 0-...- A - V 0	SC12- MG -...- 1-...- A - V 0
SC12- MU -...- 0-...- A - V 0	SC12- MU -...- 1-...- A - V 0
SC12- NG -...- 0-...- A - V 0	SC12- NG -...- 1-...- A - V 0
SC12- NU -...- 0-...- A - V 0	SC12- NU -...- 1-...- A - V 0

3.9.2.1 Port sizes

	Port	ISO 1179 Part 1	ISO 11926 Part 1	
	P	Pump	G1"	1 5/16-12UN
	T	Tank	G1"	1 5/16-12UN
	X, X2	Pilot oil supply	G1/4"	9/16-18UNF
	X1	Pilot oil supply	G1/4"	9/16-18UNF
	XL	Load sensing	G1/4"	9/16-18UNF
	Y	Pilot oil unloading	G1/4"	9/16-18UNF
	MP	Test point, pump	G1/4"	9/16-18UNF
	MT	Test point, tank	G1/4"	9/16-18UNF

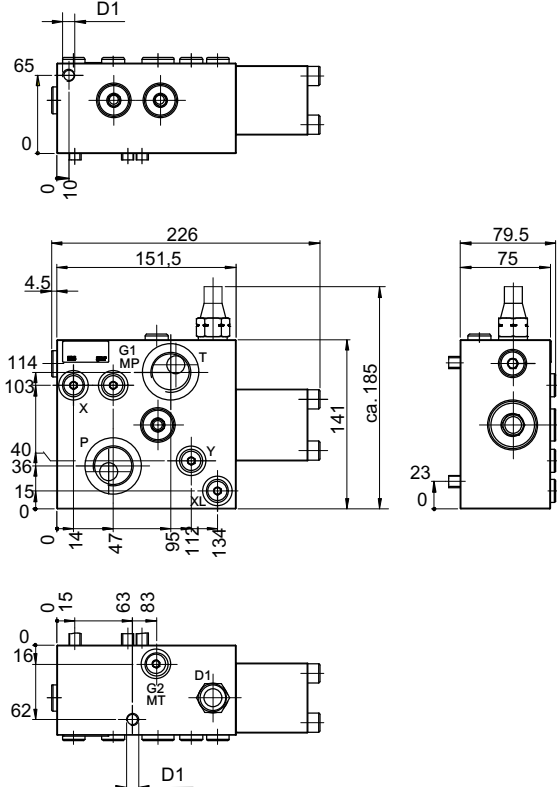
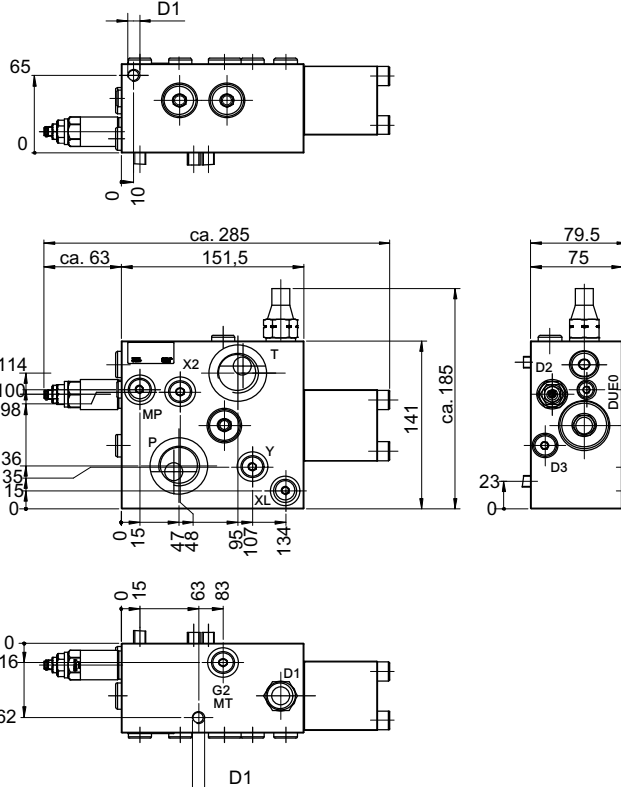
3.9.2.2 Mounting thread

Ordering code	Mounting	
	D1	Depth
SC12- G -...- A - V 0	M10	17
SC12- U -...- A - V 0	3/8-16UNC	16

3.9.2.3 Dimensions port MT

Ordering code	Port MT (coordinates)	
	X	Y
SC12- M -...- 1-...	72	35
SC12- N -...- 1-...	119	17

3.9.3 Dimensions SC12-V...

Type and dimensions	Type and dimensions
SC12- VG _ _ _ _ _ 0 _ _ _ _ A - V 0 SC12- VU _ _ _ _ _ 0 _ _ _ _ A - V 0	SC12- VG _ _ _ _ _ 1 _ _ _ _ A - V 0 SC12- VU _ _ _ _ _ 1 _ _ _ _ A - V 0
	

3.9.3.1 Port sizes

Port	Port	ISO 1179 Part 1	ISO 11926 Part 1
P	Pump	G1"	1 5/16-12UN
T	Tank	G1"	1 5/16-12UN
X, X2	Pilot oil supply	G1/4"	9/16-18UNF
XL	Load sensing	G1/4"	9/16-18UNF
Y	Pilot oil unloading	G1/4"	9/16-18UNF
MP	Test point, pump	G1/4"	9/16-18UNF
MT	Test point, tank	G1/4"	9/16-18UNF

3.9.3.2 Mounting thread

Ordering code	Mounting	
	Port	Depth
SC12- G _ _ _ _ _ A - V 0	M10	17
SC12- U _ _ _ _ _ A - V 0	3/8-16UNC	16

3.9.4 Dimensions SC12-ME... and SC12-NE...

Type and dimensions	Type and dimensions
SC12- MEG _ _ _ _ _ 0-...- A - V 0	SC12- MEG _ _ _ _ _ 1-...- A - V 0
SC12- MEU _ _ _ _ _ 0-...- A - V 0	SC12- MEU _ _ _ _ _ 1-...- A - V 0
SC12- NEG _ _ _ _ _ 0-...- A - V 0	SC12- NEG _ _ _ _ _ 1-...- A - V 0
SC12- NEU _ _ _ _ _ 0-...- A - V 0	SC12- NEU _ _ _ _ _ 1-...- A - V 0

3.9.4.1 Port sizes

Port	Port	ISO 1179 Part 1	ISO 1179 Part 1
P	Pump	G1"	1 5/16-12UN
T	Tank	G1"	1 5/16-12UN
X, X2	Pilot oil supply	G1/4"	9/16-18UNF
X1	Port for external pressure valve	G1/4"	9/16-18UNF
XL	Load sensing	G1/4"	9/16-18UNF
Y	Pilot oil unloading	G1/4"	9/16-18UNF
MP	Test point, pump	G1/4"	9/16-18UNF
MT	Test point, tank	G1/4"	9/16-18UNF

3.9.4.2 Mounting thread

Ordering code	Mounting	
	D1	Depth
SC12- G _ _ _ _ _ A - V 0	M10	17
SC12- U _ _ _ _ _ A - V 0	3/8-16UNC	16

3.9.4.3 Dimensions Port MP

Ordering code	Port MP (coordinates)	
	Port	ISO 1179 Part 1
SC12- ME _ _ _ _ _ 1-...	28	31
SC12- NE _ _ _ _ _ 1-...	18	18

4 Actuator modules

4.1 Functional description

The SC12 series valve is a proportional directional control valve that works in accordance with the load-sensing principle.

The main control spool (3) determines the direction of flow and the rate of flow to the actuator ports A and B. When the main control spool is in the neutral position, there is no connection from pump port P to the actuator ports A and B. The load-sensing galleries are unloaded to tank. In this position, the pressure compensator spool (1) is pushed to the left against the pressure compensator control spring (2) by the pump pressure.

Adjustable stroke limiters (4, 5) determine the maximum flow rate for the respective actuator.

The pressure reducing valves (6) regulate the position of the main control spool. The magnitude of the electrical current at the pressure reducing valve determines the level of the pilot pressure. The pressure reducing valves are connected to the spring chambers of the main control spool, and the pilot pressure from one or other of these valves acts on the respective end face of the spool and thus controls the spool stroke (P → A or P → B).

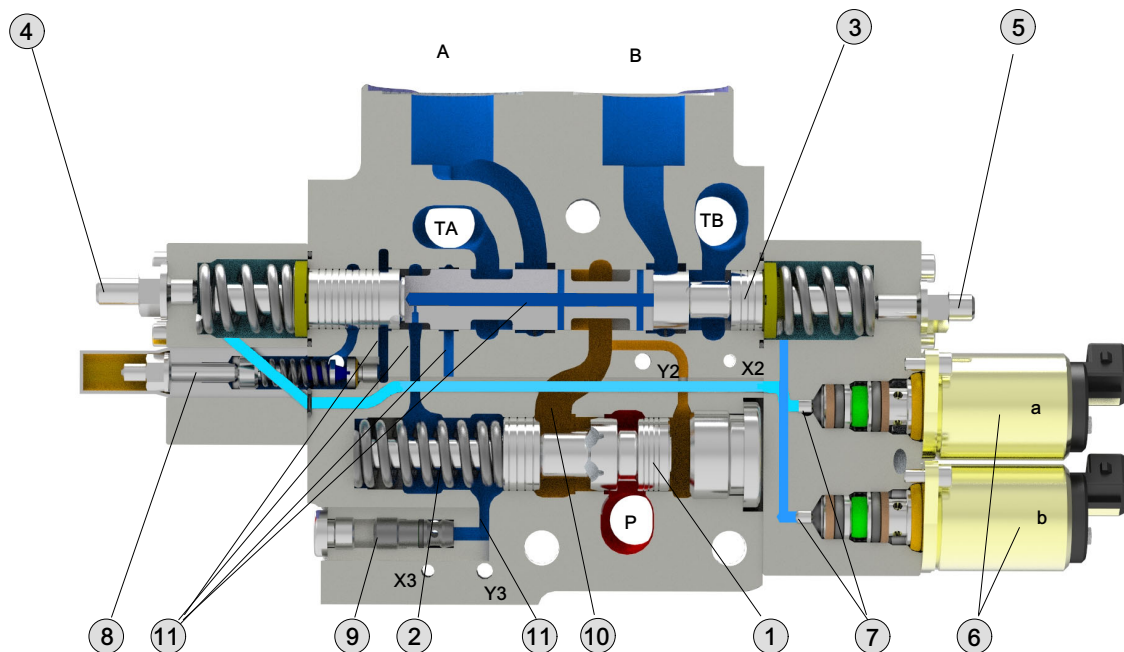
The 2-way pressure compensator has several functions. When the proportional valve is operated, the load-sensing

galleries (11) establish a connection between actuator port A or B and the spring chamber of the pressure compensator. The load pressure, assisted by the pressure compensator control spring (2), moves the pressure compensator spool (1) to the right against the reduced pump pressure (10) and into its control position. This process ensures that the flow rate through the actuator module is constantly controlled if there are pressure changes at the pump or the actuator ports. The flow rate to the actuator remains constant even under varying load pressures.

If the load pressure exceeds the value set at the pilot pressure relief valve (8), the pressure compensator spool (1) takes on the function of a pressure reducing valve. This restricts the flow rate from the pump to the actuator (primary pressure cut-off).

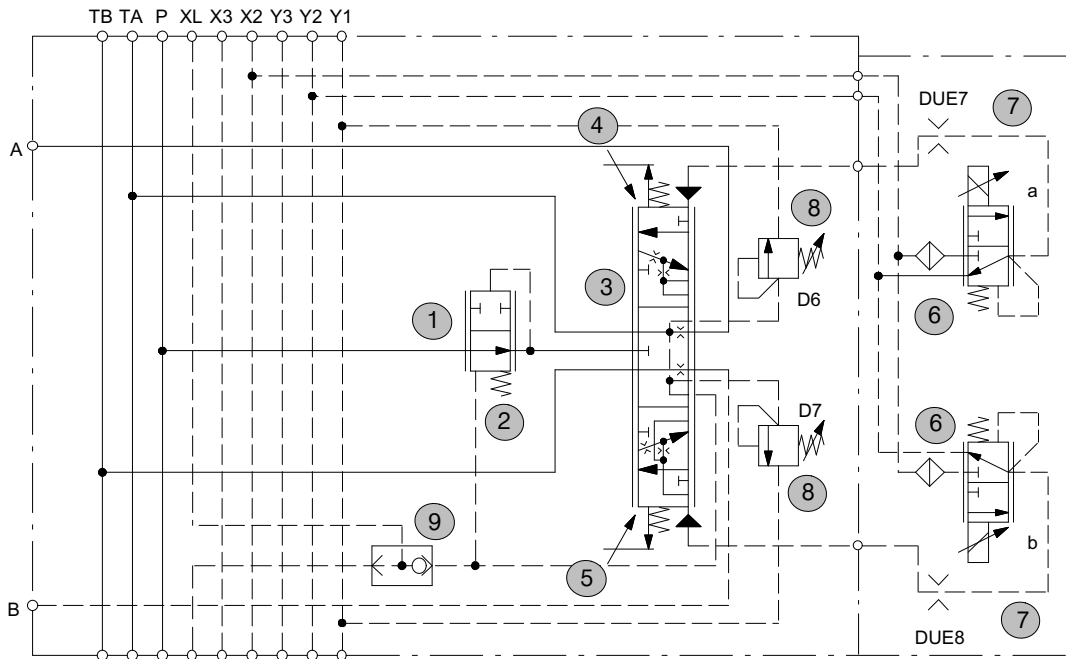
Backflow of the hydraulic fluid (A → P or B → P) can be prevented by using a pressure compensator with a load-holding function. This pressure compensator function is not leak-free. When using load-holding valves (load control valves, pilot-operated non-return valves), this pressure compensator function is not required.

The highest load pressure is signalled to the pump via shuttle valves (9).



Main valve spool in neutral position (spool pattern CA – A connected with TA, B with TB). Pressure compensator without load-holding function (actuator section Y)

4.1.1 Schematic



4.1.2 Description

	Description
1	Pressure compensator spool
2	Pressure compensator control spring
3	Main spool
4	Stroke limiter, A-side
5	Stroke limiter, B-side
6	Pressure reducing valve
7	Damping orifice (pressure reducing valve)
8	Pilot pressure relief valve
9	Shuttle valve (load sensing system)
10	Reduced pump pressure
11	Load sensing gallery

4.1.3 Port

	Port
P	Pump
A, B	Actuator
TA, TB	Tank
X2, X3	Pilot oil supply
XL	Load sensing
Y1	Tank (pilot pressure relief valve)
Y2, Y3	Pilot oil unloading

4.2 Pressure compensator spool variants

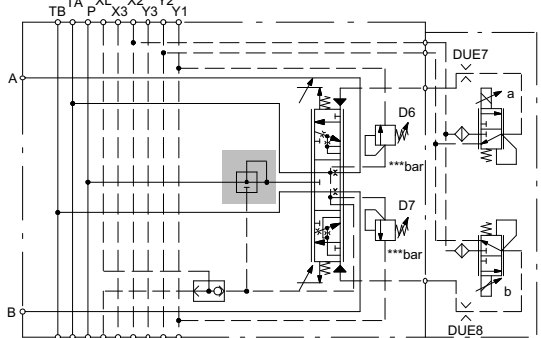
4.2.1 Pressure compensator without load-holding function

Type, symbol and characteristic curve	Description
SC12- Y/...../...../...../.....- A - V...	
	<ul style="list-style-type: none"> pressure compensator without load-holding function
	<p>Flow control characteristics (2-way pressure compensator without load-holding function)</p> <p>Q = actuator flow A or B Δp = pump pressure - load pressure</p>

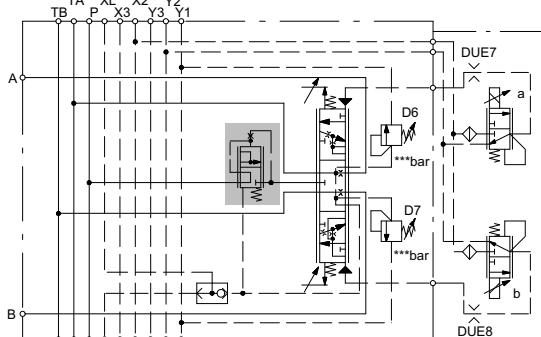
4.2.2 Pressure compensator with load-holding function

Type and symbol and characteristic curve	Description
SC12- Z/...../...../...../.....- A - V 13	
	<ul style="list-style-type: none"> load-holding function is not leakage-free reduced pump pressure tap-off is plugged <p>Caution: maximum flow rate 95 l/min.</p>
	<p>Flow control characteristics (2-way pressure compensator with load-holding function)</p> <p>Q = actuator flow, A or B Δp = pump pressure - load pressure</p>

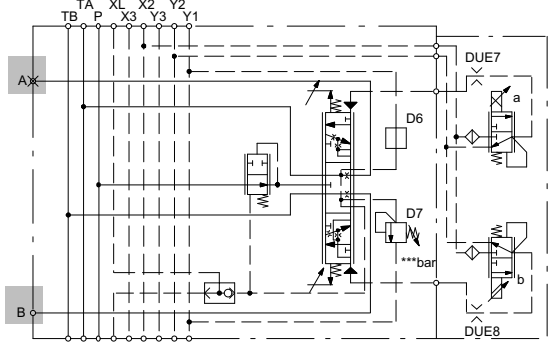
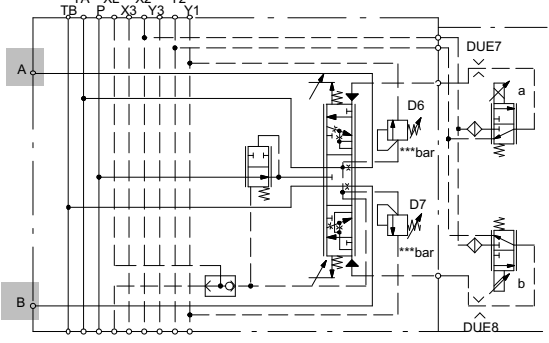
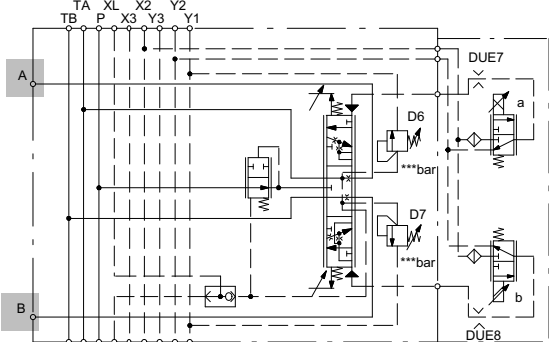
4.2.3 No pressure-compensator function

Type and symbol	Description
SC12- T/...../...../...../.....- A - V...	
	<ul style="list-style-type: none"> • pressure compensator is disabled • no load-holding function <p>Note: The actuator flow rate depends on the pump pressure and the load pressure.</p>

4.2.4 Load-holding valve function

Type and symbol	Description
SC12- R/...../...../...../.....- A - V 13	
	<ul style="list-style-type: none"> • pressure compensator is disabled • load-holding function is not leakage-free • reduced pump pressure tap-off is plugged <p>Note: The actuator flow rate depends on the pump pressure and the load pressure.</p>

4.3 Valve body variants

Type and symbol	Description
<p>SC12-__2-.../.../.../.../.../...-A-V...</p> 	<p>SC12-__G2-...</p> <ul style="list-style-type: none"> • port A = G1/2": plugged • port B = G1/2": open <p>SC12-__H2-...</p> <ul style="list-style-type: none"> • port A = G3/4": plugged • port B = G3/4": open <p>SC12-__U2-...</p> <ul style="list-style-type: none"> • port A = 7/8-14UNF: plugged • port B = 7/8-14UNF: open <p>SC12-__V2-...</p> <ul style="list-style-type: none"> • port A = 1 1/16-12UN: plugged • port B = 1 1/16-12UN: open
<p>SC12-__3-.../.../.../.../.../...-A-V...</p> 	<p>SC12-__G3-...</p> <ul style="list-style-type: none"> • port A = G1/2": open • port B = G1/2": open <p>SC12-__H3-...</p> <ul style="list-style-type: none"> • port A = G3/4": open • port B = G3/4": open <p>SC12-__U3-...</p> <ul style="list-style-type: none"> • port A = 7/8-14UNF: open • port B = 7/8-14UNF: open <p>SC12-__V3-...</p> <ul style="list-style-type: none"> • port A = 1 1/16-12UN: open • port B = 1 1/16-12UN: open
<p>SC12-__4-.../.../.../.../.../...-A-V...</p> 	<ul style="list-style-type: none"> • prepared with valves for bolt-on plate <p>Note: Only available in combination with bolt-on plates.</p> <p>Version without pipe connections SC12-__A4-...</p> <p>Version with pipe connections SC12-__A4-... thread (ISO 1179 - Part 1 Whitworth-thread)</p> <p>SC12-__B4-... thread (ISO 11926 - Part 1 UNF-thread)</p>

4.4 Primary-pressure cut-off

Type and symbol	Description
	<p>Q = actuator flow, A or B p_{XL} = load pressure</p> <p>minimum setting: 50 bar maximum setting: 370 bar</p>

IMPORTANT!

The setting of the system pressure relief in the inlet module must be 20 bar higher than the highest value of the primary-pressure cut-off in the actuator modules.

4.4.1 2 x primary-pressure cut-offs

Type and symbol	Description
SC12-...- D***/D*** -.../...- A - V...	
	<ul style="list-style-type: none"> pressure setting in bar for actuator port A (3-digit) pressure setting in bar for actuator port B (3-digit)

4.4.2 1 x venting plug and 1 x primary-pressure cut-off

Name and symbol	Description
SC12-...- T000/D*** -.../...- A - V...	
	<ul style="list-style-type: none"> venting plug – primary-pressure cut-off (connection: open) for actuator port A pressure setting in bar for actuator port B (3-digit)

4.4.3 1 x sealing plug and 1 x primary-pressure cut-off

Name and symbol	Description
SC12-...- S000/D*** -.../...-...-...-.../...- A - V...	
	<ul style="list-style-type: none"> • sealing plug - primary-pressure cut-off (connection: shut off) for actuator port A • pressure setting in bar for actuator port B (3-digit)

4.4.4 1 x primary-pressure cut-off (A- and B-side jointly)

Name and symbol	Description
SC12-...- X000/G*** -.../...-...-...-.../...- A - V...	
	<ul style="list-style-type: none"> • pressure setting in bar for actuator port A and B (3-digit)

4.4.5 Without primary-pressure cut-off

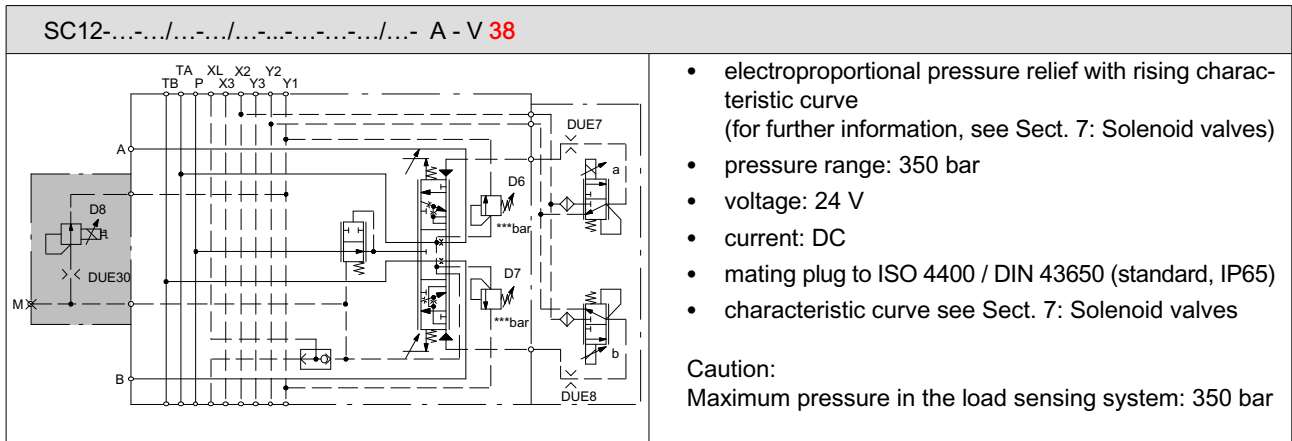
Name and symbol	Description
SC12-...- S000/S000 -.../...-...-...-.../...- A - V...	
	<ul style="list-style-type: none"> • sealing plug - primary-pressure cut-off (connection: shut off) for actuator port A • sealing plug - primary-pressure cut-off (connection: shut off) for actuator port B

4.4.6 Separate load-sensing tapping

Type and symbol	Description
SC12-...../...../...../...../.....- A - V <u> </u>	
	<p>Port thread G or H</p> <ul style="list-style-type: none"> port XLA = G1/4": plugged port XLB = G1/4": plugged <p>Port thread U or V</p> <ul style="list-style-type: none"> port XLA = 9/16-18UNF: plugged port XLB = 9/16-18UNF: plugged <p>Version without secondary valves SC12-...../...../...../...../.....- X000/X000 - A - V 7</p> <p>Version with secondary valves SC12-...../...../...../...../.....-L...../.....- A - V 31 SC12-...../...../...../...../.....-N...../.....- A - V 31 SC12-...../...../...../...../.....-S...../.....- A - V 31</p>
SC12-...../...../...../...../.....- A - V 23	
	<p>Port thread G or H</p> <ul style="list-style-type: none"> port XL5 = G1/4": plugged <p>Port thread U or V</p> <ul style="list-style-type: none"> port XL5 = 9/16-18UNF: plugged

4.4.7 Electroproportional pressure relief

Type and symbol	Description
SC12-...../...../...../...../.....- A - V 37	
	<ul style="list-style-type: none"> electroproportional pressure relief with falling characteristic curve (for further information, see Sect. 7: Solenoid valves) pressure range: 350 bar voltage: 24 V current: DC mating plug to ISO 4400 / DIN 43650 (standard, IP65) characteristic curve, see Sect. 7: Solenoid valves <p>Caution: Maximum pressure in the load sensing system: 350 bar</p>

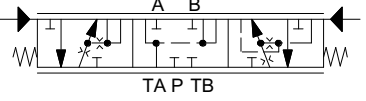
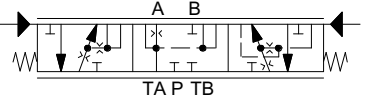
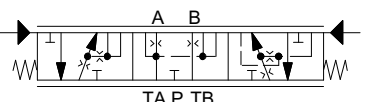
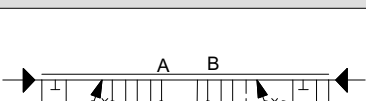
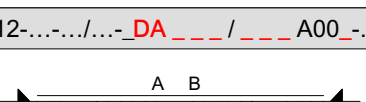


4.5 Main valve spool

4.5.1 Spool position

Type and symbol	Description
SC12-...../.....- 1/.....- A - V...	<ul style="list-style-type: none"> • spool with 2 switched positions <ul style="list-style-type: none"> • control at a
SC12-...../.....- 3/.....- A - V...	<ul style="list-style-type: none"> • spool with 3 switched positions <ul style="list-style-type: none"> • control at a and b

4.5.2 Spool type

Type and symbol	Description
SC12-...-.../...- AA -... / ...- A00-...-...-.../...- A - V...	 <ul style="list-style-type: none"> • spool type AA • flow rate data in l/min for actuator port A (3-digit) • flow rate data in l/min for actuator port B (3-digit) • corresponding pressure-compensator spring
SC12-...-.../...- BA -... / ...- A00-...-...-.../...- A - V...	 <ul style="list-style-type: none"> • spool type BA • flow rate data in l/min for actuator port A (3-digit) • flow rate data in l/min for actuator port B (3-digit) • corresponding pressure-compensator spring
SC12-...-.../...- CA -... / ...- A00-...-...-.../...- A - V...	 <ul style="list-style-type: none"> • spool type CA (throttled-open neutral position) • flow rate data in l/min for actuator port A (3-digit) • flow rate data in l/min for actuator port B (3-digit) • corresponding pressure-compensator spring
SC12-...-.../...- CB -... / ...- A00-...-...-.../...- A - V...	 <ul style="list-style-type: none"> • spool type CB (open neutral position) • flow rate data in l/min for actuator port A (3-digit) • flow rate data in l/min for actuator port B (3-digit) • corresponding pressure-compensator spring
SC12-...-.../...- DA -... / ...- A00-...-...-.../...- A - V...	 <ul style="list-style-type: none"> • spool type DA • flow rate data in l/min for actuator port A (3-digit) • flow rate data in l/min for actuator port B (3-digit) • corresponding pressure-compensator spring

Note: For a spool with 2 operating positions (spool position 1), the flow rate for actuator port A is given as the flow rate for actuator port B.

4.5.3 Flow rate

4.5.3.1 Symmetrical spools

Flow rate (A-side / B-side) [l/min]

Compensator	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B	Q _A /Q _B
Y	130/130	090/090	060/060	040/040	027/027	018/018	012/012	008/008
Z	095/095	065/065	044/044	030/030	020/020	013/013	009/009	006/006
R								
T								

Note:

With the R and T pressure compensators, the circuit design is done by Bucher Hydraulics.

4.5.3.2 Asymmetrical spools

The higher flow rate should be assigned to the A side.

For combinations, please contact Bucher Hydraulics.

4.5.3.3 Example

Flow rate A-side / B-side: 100/100 l/min

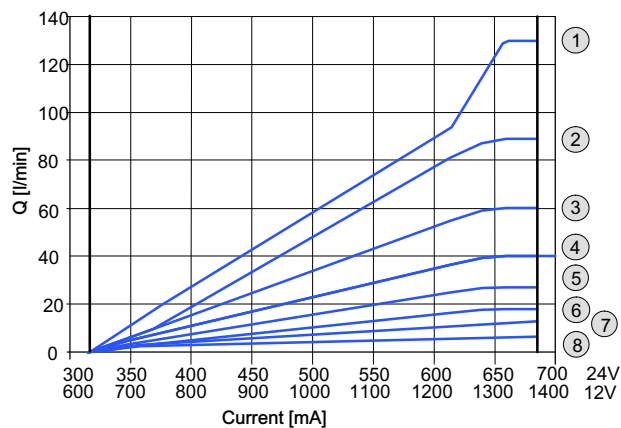
1. Table (Section 4.5.3.1): Pressure compensator Y -> spool valve with flow rate Q_A/Q_B = 130/130 l/min
2. The setting to 100/100 l/min is made either by the stroke limiter or, in the case of the On Board Electronics (OBE) operation type, by the electronics.

4.5.4 Performance graphs

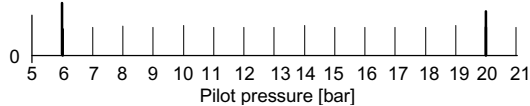
4.5.4.1 Flow-rate characteristic

Q = actuator flow rate to A or B

Electrohydraulic operation



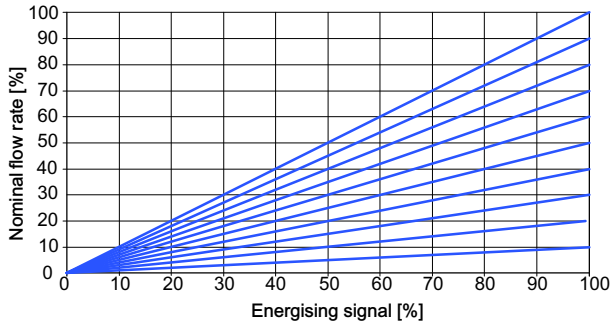
Hydraulic operation



Graph	Actuator flow rate [l/min]	
1	130	Compensator: Y (w/out load-hold function)
2	90	
3	60	Spool geometry: A00
4	40	
5	27	Compensator spring: N
6	18	
7	12	
8	8	

4.5.4.2 Onboard electronics: Electrohydraulic actuator (EHA)

Example: linear characteristic

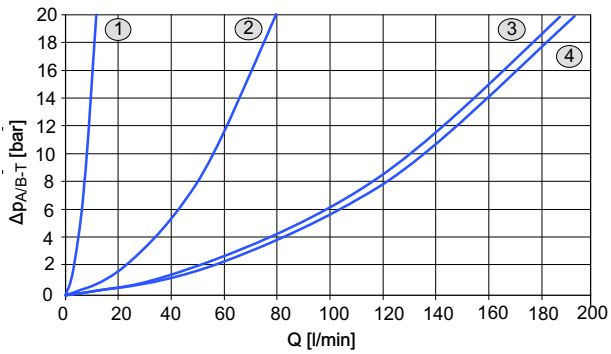


With the 'Onboard Electronics' type of operation, other kinds of characteristic curves are possible. For other versions, please enquire.

4.5.4.3 Pressure differential A/B - T

Q = actuator flow rate to A or B

Δp = actuator pressure - tank pressure

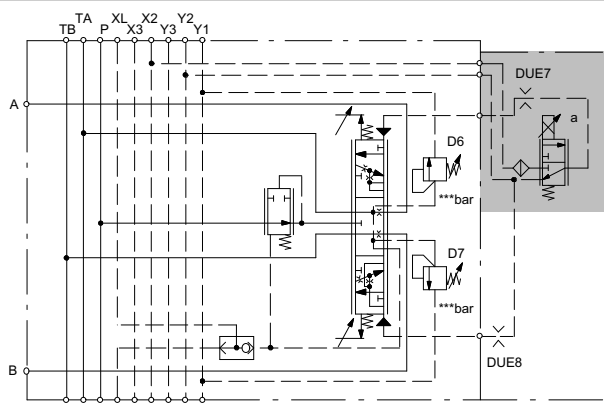
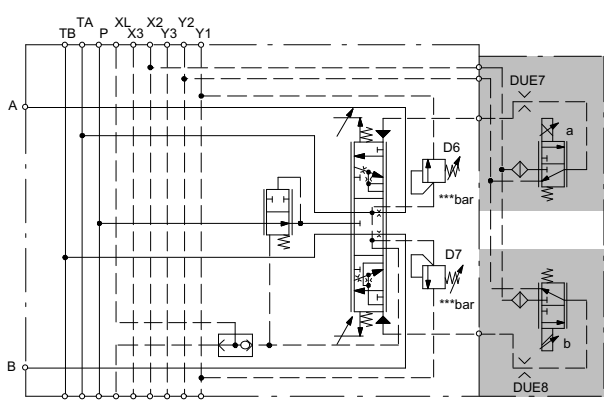
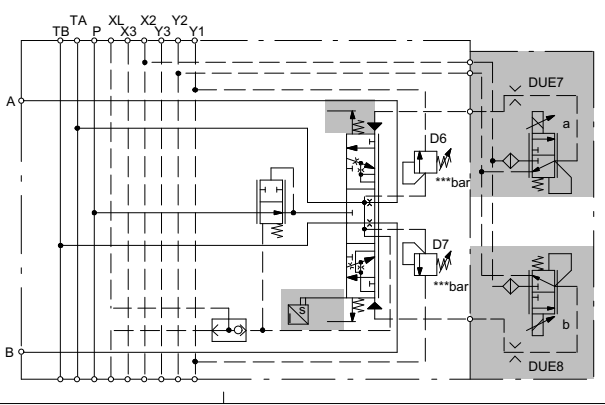


Graph	Spool pattern	
1	CA	Neutral position
2	CB	
3	AA or CA	100% energisation
4	CB	

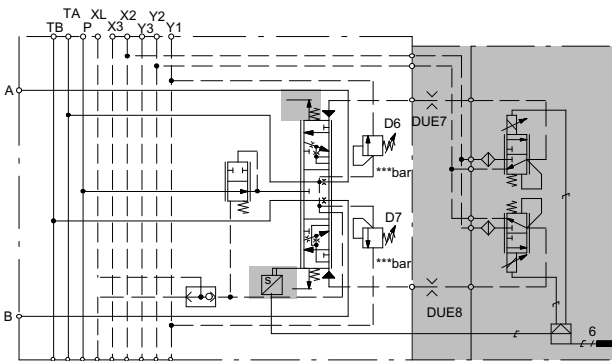
4.6 Types of operation

4.6.1 Operation type – electrohydraulic proportional + onboard electronics

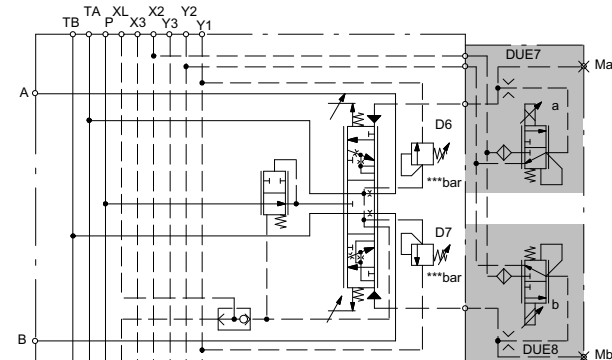
4.6.1.1 Electrohydraulic proportional

Type and symbol	Description
SC12-...-...-...- 1...-...- E _ _ X - X - XX -...-...- A - V...	
	<ul style="list-style-type: none">• proportional pressure reducing valve• without displacement sensor• without hydraulic operation• without manual operation• control at a• damping orifice (at both sides)• spool types AA, CA, CB
SC12-...-...-...- 3...-...- E _ _ X - X - XX -...-...- A - V...	
	<ul style="list-style-type: none">• proportional pressure reducing valves• without displacement sensor• without hydraulic operation• without manual operation• control at a and b• damping orifice (at both sides)• spool types AA, BA, CA, CB, DA
SC12-...-...-...- 3...-...- E _ _ A - X - XX -...-...- A - V43	
	<ul style="list-style-type: none">• proportional pressure reducing valves• displacement sensor• without hydraulic operation• without manual operation• control at a and b• damping orifice (at both sides)• spool types AA, BA, CA, CB, DA <p>Note: Without stroke limiter for the main spool</p>

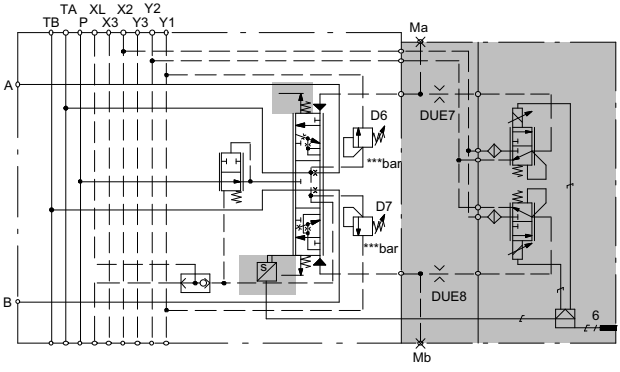
4.6.1.2 On Board Electronic (OBE)

Type and symbol	Description
SC12-...-...-...-3...-...-E36B-X-XX-...-...-A-V43...	
	<ul style="list-style-type: none"> digital interface with displacement sensor electronic pilot module EHA without hydraulic operation without manual operation control at a and b damping orifice (at both sides) spool types AA, BA, CA, CB, DA <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar.</p> <p>Only in combination with</p> <ul style="list-style-type: none"> inlet module with external pilot-oil supply or inlet module with pilot-pressure conditioning <p>Note: Without stroke limiter for the main spool</p> <p>Note: Circuit design by Bucher Hydraulics</p>

4.6.1.3 Electrohydraulic proportional, with test points for the pilot pressure (A- and B-sides)

Type and symbol	Description
SC12-...-...-...-3...-...-E__X-X-XX-...-...-A-V__	
	<ul style="list-style-type: none"> proportional pressure reducing valves without displacement sensor without hydraulic operation without manual operation control at a and b test points for the pilot pressure (A- and B-sides) damping orifice (at both sides) spool types AA, BA, CA, CB, DA <p>Port thread G or H</p> <ul style="list-style-type: none"> port Ma = G1/4": plugged port Mb = G1/4": plugged <p>Port thread U or V</p> <ul style="list-style-type: none"> port Ma = 9/16-18UNF: plugged port Mb = 9/16-18UNF: plugged <p>Version without secondary valves SC12-...-...-...-...-...-...-X000/X000-A-V 16</p> <p>Version with secondary valves</p> <ul style="list-style-type: none"> SC12-...-...-...-...-...-...-K...-A-V 33 SC12-...-...-...-...-...-...-L...-A-V 33 SC12-...-...-...-...-...-...-N...-A-V 33 SC12-...-...-...-...-...-...-S...-A-V 33

4.6.1.4 On Board Electronic (OBE), with test points for the pilot pressure (A- and B-sides)

Type and symbol	Description
SC12-...-...-...- 3...-...- E36B - X - XX -...-...- A - V__	
	<ul style="list-style-type: none"> digital interface with displacement sensor electronic pilot module EHA without hydraulic operation without manual operation control at a and b test points for the pilot pressure (A- and B-side) damping orifice (at both sides) spool types AA, BA, CA, CB, DA <p>Port thread G or H</p> <ul style="list-style-type: none"> port Ma = G1/4": plugged port Mb = G1/4": plugged <p>Port thread U or V</p> <ul style="list-style-type: none"> port Ma = 9/16-18UNF: plugged port Mb = 9/16-18UNF: plugged <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar.</p> <p>Only in combination with</p> <ul style="list-style-type: none"> inlet module with external pilot-oil supply or inlet module with pilot-pressure conditioning <p>Note: Without stroke limiter for the main spool Note: Circuit design by Bucher Hydraulics</p> <p>Version without secondary valves SC12-...-...-...-...- X000/X000 - A - V 48</p> <p>Version with secondary valves SC12-...-...-...-...- K...-...- A - V 49 SC12-...-...-...-...- L...-...- A - V 49 SC12-...-...-...-...- N...-...- A - V 49 SC12-...-...-...-...- S...-...- A - V 49</p>

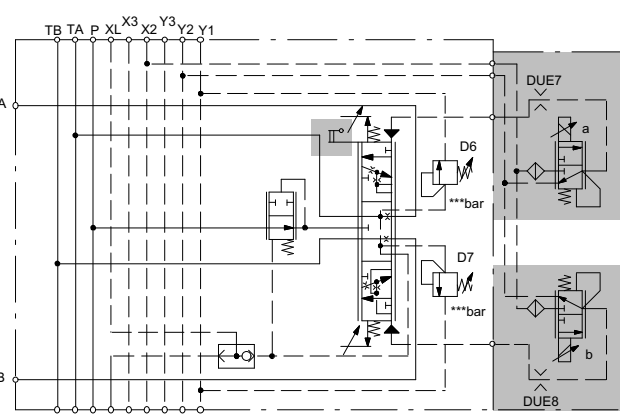
4.6.1.5 Electrohydraulic proportional and hydraulic operation

Type and symbol	Description
SC12-...-...-...-3...-...-E_X-D-XX-...-...-A-V...	
	<ul style="list-style-type: none"> • proportional pressure reducing valves • without displacement sensor • with hydraulic operation • without manual operation • control at a and b • damping orifice (at both sides) • spool types AA, BA, CA, CB, DA

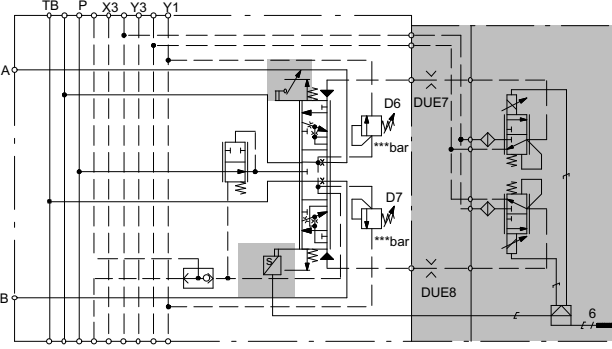
4.6.1.6 On Board Electronic (OBE) and hydraulic operation

Type and symbol	Description
SC12-...-...-...-3...-...-E36B-D-XX-...-...-A-V43	
	<ul style="list-style-type: none"> • digital interface with displacement sensor • electronic pilot module EHA • hydraulic operation • without manual operation • control at a and b • damping orifice (at both sides) • spool types AA, BA, CA, CB, DA <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar.</p> <p>Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning <p>Note: Without stroke limiter for the main spool</p> <p>Note: Circuit design by Bucher Hydraulics</p>

4.6.1.7 Electrohydraulic proportional and hand lever

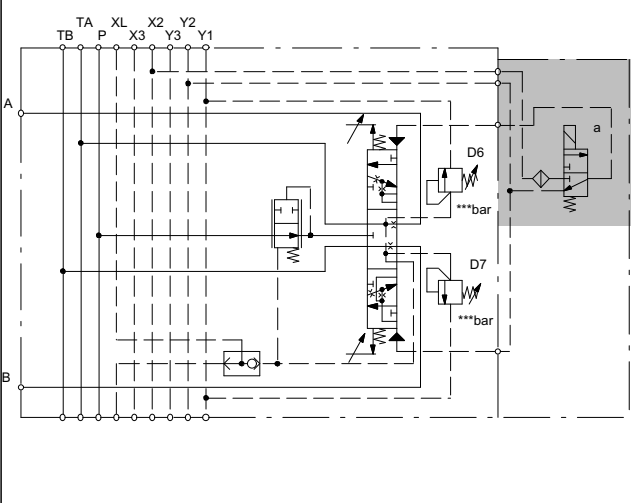
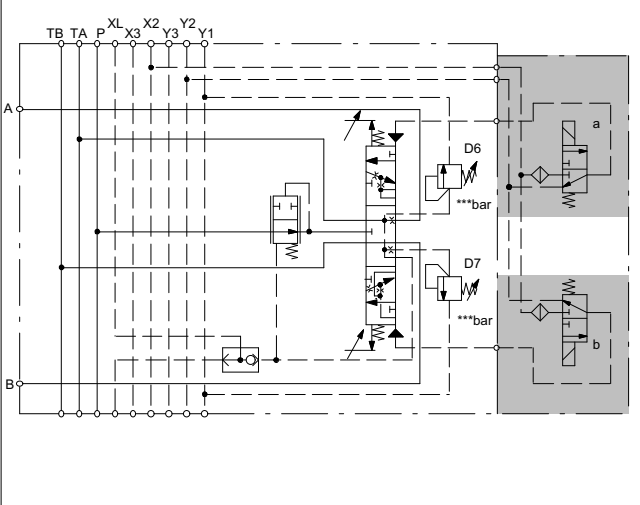
Type and symbol	Description
SC12-...-.../...- 3 .../...- E_X-X-_-_- .../...- A - V...	
	<ul style="list-style-type: none"> proportional pressure reducing valves without displacement sensor without hydraulic operation manual operation follower-type hand lever: The mechanical operator can override the electrohydraulic operation. The hand lever is directly connected to the main spool and follows the spool movement during electrohydraulic operation. all lever positions can be supplied control at a and b damping orifice (at both sides) spool types AA, BA, CA, CB, DA <p>Version without secondary valves manual operation (standard) SC12-...-.../...-...-...-...-...-...-...-...-...-...-H-X000/X000- A - V...</p> <p>Emergency manual operation (short lever) SC12-...-.../...-...-...-...-...-...-...-...-...-...-N-X000/X000- A - V...</p> <p>Version with secondary valves manual operation (standard) SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-H-L.../...- A - V... SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-H-N.../...- A - V... SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-H-S.../...- A - V...</p> <p>Emergency manual operation (short lever) SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-N-L.../...- A - V... SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-N-N.../...- A - V... SC12-...-.../...-...-...-...-...-...-...-...-...-...-...-...-...-N-S.../...- A - V...</p>

4.6.1.8 Onboard electronics (OBE) and hand lever

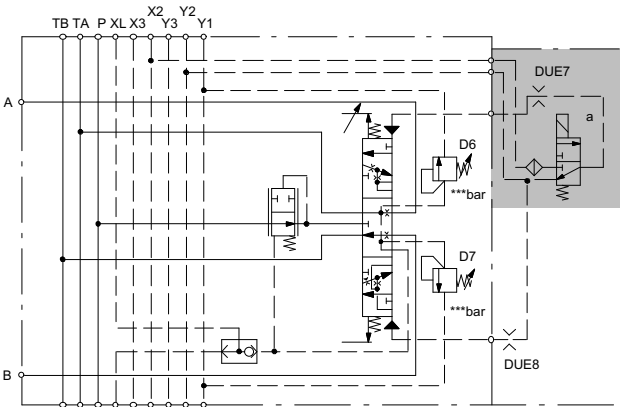
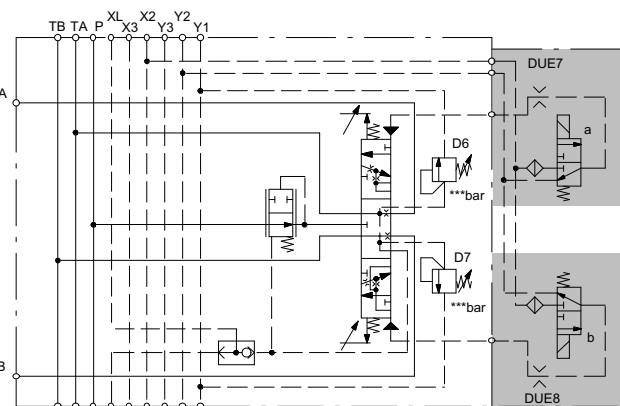
Type and symbol	Description
<p>SC12-.../.../...- 3.../...- E36B - X -_.../...- A - V 26</p> 	<ul style="list-style-type: none"> • digital interface with displacement sensor • electronic pilot module EHA • without hydraulic operation • manual operation • follower-type hand lever: The mechanical operator can override the electrohydraulic operation. The hand lever is directly connected to the main spool and follows the spool movement during electrohydraulic operation. • all lever positions can be supplied • control at a and b • damping orifice (at both sides) • spool types AA, BA, CA, CB, DA <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 0 bar.</p> <p>Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning <p>Note: Circuit design by Bucher Hydraulics</p> <p>Version without secondary valves manual operation (standard) SC12-.../.../...- H_ X000/X000 - A - V...</p> <p>Emergency manual operation (short lever) SC12-.../.../...- N_ X000/X000 - A - V...</p> <p>Version with secondary valves manual operation (standard) SC12-.../.../...- H_ L.../...- A - V... SC12-.../.../...- H_ N.../...- A - V... SC12-.../.../...- H_ S.../...- A - V...</p> <p>Emergency manual operation (short lever) SC12-.../.../...- N_ L.../...- A - V... SC12-.../.../...- N_ N.../...- A - V... SC12-.../.../...- N_ S.../...- A - V...</p>

4.6.2 Operation type – electrohydraulic on-off

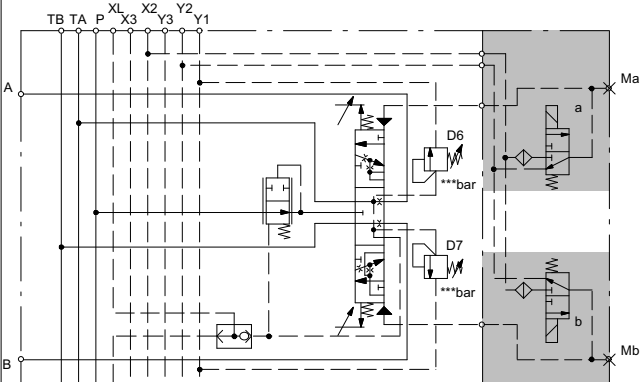
4.6.2.1 Electrohydraulic on-off without damping orifice

Type and symbol	Description
<p style="text-align: center;">SC12-...-...-...-1...-...-E_X-X-XX-...-...-A-V 17</p> 	<ul style="list-style-type: none"> • on-off valve • without displacement sensor • without hydraulic operation • without manual operation • control at a • without damping orifice • spool types AA, CA, CB <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p>Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning
<p style="text-align: center;">SC12-...-...-...-3...-...-E_X-X-XX-...-...-A-V 17</p> 	<ul style="list-style-type: none"> • on-off valves • without displacement sensor • without hydraulic operation • without manual operation • control at a and b • without damping orifice • spool types AA, BA, CA, CB, DA <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p>Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning

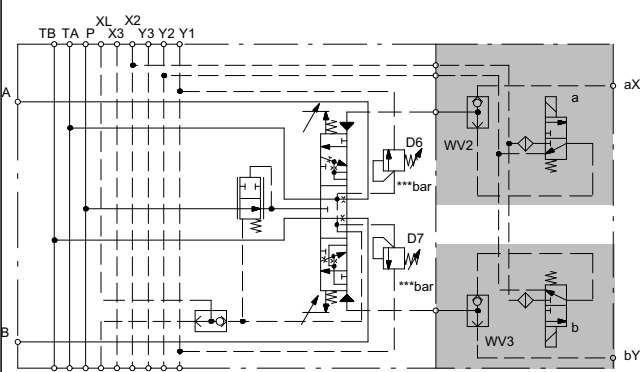
4.6.2.2 Electrohydraulic on-off, with damping orifices at both sides

Type and symbol	Description
<p data-bbox="188 331 758 360">SC12-...-...-...-1...-...-E_X-X-XX-...-...-A-V 0</p>  <p>The diagram shows a 4/3-way electrohydraulic valve with two solenoid-operated spools (D6 and D7) and two damping orifices (DUE7 and DUE8). The valve is controlled at position 'a'. The pilot stage is a 2/2-way valve with a damping orifice (DUE8). The valve has two hydraulic ports, A and B, and several pilot ports (X1, X2, X3, Y1, Y2, Y3, XL, TA, TB, P).</p>	<ul data-bbox="837 380 1197 627" style="list-style-type: none"> • on-off valve • without displacement sensor • without hydraulic operation • without manual operation • control at a • damping orifice (at both sides) • spool types AA, CA, CB <p data-bbox="837 660 1276 705">Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p data-bbox="837 739 1085 772">Only in combination with</p> <ul data-bbox="837 772 1340 873" style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning
<p data-bbox="188 891 758 920">SC12-...-...-...-3...-...-E_X-X-XX-...-...-A-V 0</p>  <p>The diagram shows a 4/3-way electrohydraulic valve with two solenoid-operated spools (D6 and D7) and two damping orifices (DUE7 and DUE8). The valve is controlled at positions 'a' and 'b'. The pilot stage is a 2/2-way valve with a damping orifice (DUE8). The valve has two hydraulic ports, A and B, and several pilot ports (X1, X2, X3, Y1, Y2, Y3, XL, TA, TB, P).</p>	<ul data-bbox="837 940 1212 1187" style="list-style-type: none"> • on-off valves • without displacement sensor • without hydraulic operation • without manual operation • control at a and b • damping orifice (at both sides) • spool types AA, BA, CA, CB, DA <p data-bbox="837 1220 1276 1265">Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p data-bbox="837 1299 1085 1332">Only in combination with</p> <ul data-bbox="837 1332 1340 1433" style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning

**4.6.2.3 Electrohydraulic on-off, without damping orifices,
with test points for the pilot pressure (A- and B-side)**

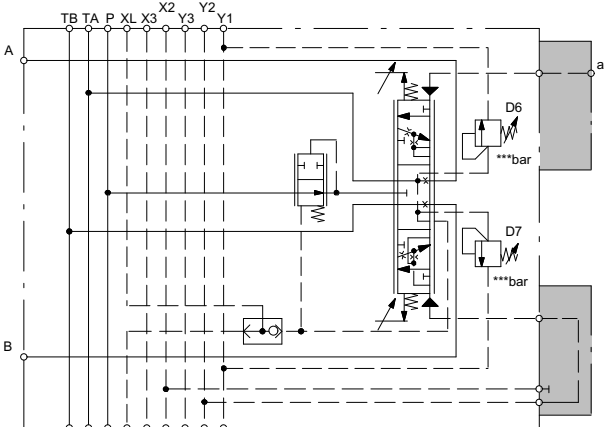
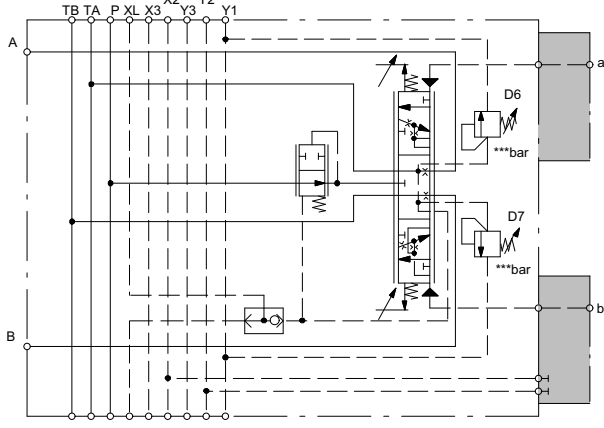
Type and symbol	Description
<p data-bbox="188 353 770 385">SC12-...-...-...- 3...-...- E _ _ X - X - XX -...-...- A - V _ _</p> 	<ul style="list-style-type: none"> • on-off valves • without displacement sensor • without hydraulic operation • without manual operation • control at a and b • test points for the pilot pressure (A- and B-side) • without damping orifice • spool types AA, BA, CA, CB, DA <p>Connection thread G or H</p> <ul style="list-style-type: none"> • port Ma = G1/4": plugged • port Mb = G1/4": plugged <p>Connection thread U or V</p> <ul style="list-style-type: none"> • port Ma = 9/16-18UNF: plugged • port Mb = 9/16-18UNF: plugged <p>Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p>Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning <p>Version without secondary valves SC12-...-...-...-...-...-...- X000/X000 - A - V 20</p> <p>Version with secondary valves SC12-...-...-...-...-...-...- K...-...- A - V 34 SC12-...-...-...-...-...-...- L...-...- A - V 34 SC12-...-...-...-...-...-...- N...-...- A - V 34 SC12-...-...-...-...-...-...- S...-...- A - V 34</p>

4.6.2.4 Electrohydraulic on-off and hydraulic operation

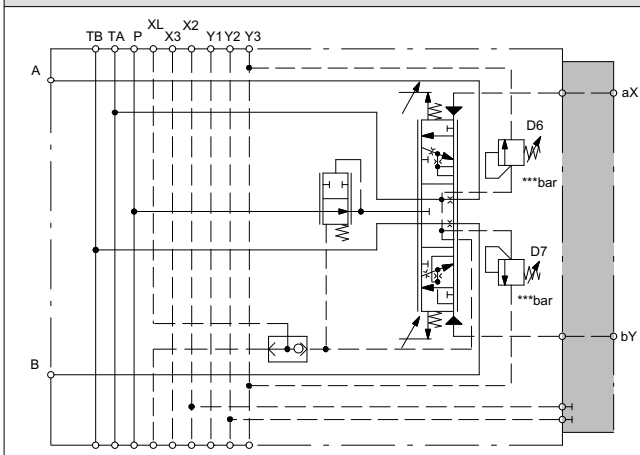
Type and symbol	Description
<p data-bbox="188 331 758 358">SC12-...-...-...-3...-...-E_X-D-XX-...-...-A-V...</p> 	<ul style="list-style-type: none"> • on-off valves • without displacement sensor • hydraulic operation • without manual operation • control at a and b • without damping orifice • spool types AA, BA, CA, CB, DA <p data-bbox="834 645 1278 701">Caution: Maximum supply pressure to the electrohydraulic pilot stage: 50 bar</p> <p data-bbox="834 734 1093 761">Only in combination with</p> <ul style="list-style-type: none"> • inlet module with external pilot-oil supply or • inlet module with pilot-pressure conditioning

4.6.3 Operation type – hydraulic

4.6.3.1 Hydraulic, without damping orifices

Type and symbol	Description
<p data-bbox="188 409 738 439">SC12-...-...-...-1...-...-X00X -_ XX -...-...- A - V _ _</p> 	<ul data-bbox="834 459 1428 694" style="list-style-type: none"> • hydraulic operation of the main spool. When not operated, centred in neutral position by springs. • without electrical operation • without manual operation • control at a • without damping orifices • spool types AA, CA, CB <p data-bbox="834 723 1193 779">Version without secondary valves vertical connection (standard)</p> <p data-bbox="834 786 1393 815">SC12-...-...-...-...-...-...-Y-...- X000/X000 - A - V 17</p> <p data-bbox="834 822 1066 851">Horizontal connection</p> <p data-bbox="834 857 1393 887">SC12-...-...-...-...-...-...-Z-...- X000/X000 - A - V 17</p> <p data-bbox="834 916 1161 972">Version with secondary valves horizontal connection</p> <p data-bbox="834 978 1337 1008">SC12-...-...-...-...-...-...-Z-...- K...-...- A - V 36</p> <p data-bbox="834 1014 1337 1043">SC12-...-...-...-...-...-...-Z-...- L...-...- A - V 36</p> <p data-bbox="834 1050 1337 1079">SC12-...-...-...-...-...-...-Z-...- N...-...- A - V 36</p> <p data-bbox="834 1086 1337 1115">SC12-...-...-...-...-...-...-Z-...- S...-...- A - V 36</p>
<p data-bbox="188 1131 738 1160">SC12-...-...-...-3...-...-X00X -_ XX -...-...- A - V _ _</p> 	<ul data-bbox="834 1180 1428 1415" style="list-style-type: none"> • hydraulic operation of the main spool. When not operated, centred in neutral position by springs. • without electrical operation • without manual operation • control at a and b • without damping orifices • spool types AA, BA, CA, CB, DA <p data-bbox="834 1444 1193 1500">Version without secondary valves vertical connection (standard)</p> <p data-bbox="834 1507 1428 1536">SC12-...-...-...-...-...-...-Y-...- X000/X000 - A - V 17</p> <p data-bbox="834 1543 1066 1572">Horizontal connection</p> <p data-bbox="834 1579 1428 1608">SC12-...-...-...-...-...-...-Z-...- X000/X000 - A - V 17</p> <p data-bbox="834 1637 1161 1693">Version with secondary valves horizontal connection</p> <p data-bbox="834 1700 1337 1729">SC12-...-...-...-...-...-...-Z-...- K...-...- A - V 36</p> <p data-bbox="834 1736 1337 1765">SC12-...-...-...-...-...-...-Z-...- L...-...- A - V 36</p> <p data-bbox="834 1771 1337 1800">SC12-...-...-...-...-...-...-Z-...- N...-...- A - V 36</p> <p data-bbox="834 1807 1337 1836">SC12-...-...-...-...-...-...-Z-...- S...-...- A - V 36</p>

SC12-...-...-...-3...-...-X00X-D-XX-...-...-A-V 17

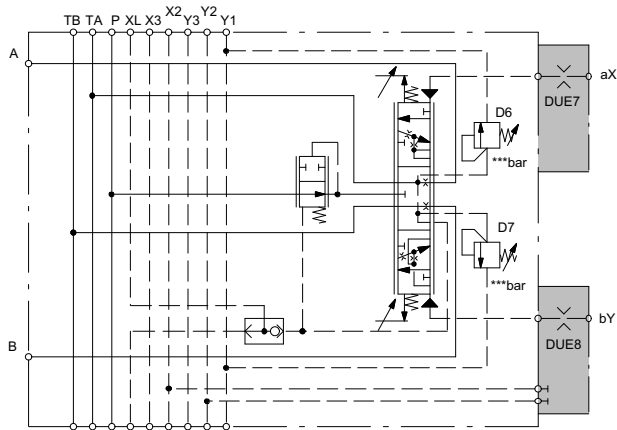


- hydraulic operation of the main spool. (Duo head: 1 cover with 2 ports). When not operated, centred in neutral position by springs.
- without electrical operation
- without manual operation
- control at a and b
- without damping orifices
- spool types AA, BA, CA, CB, DA

4.6.3.2 Hydraulic, with damping orifice at both sides

Type and symbol	Description
SC12-...-...-...-1...-...-X00X-_-XX-...-...-A-V_ _	
	<ul style="list-style-type: none"> • hydraulic operation of the main spool. When not operated, centred in neutral position by springs. • without electrical operation • without manual operation • control at a • damping orifice (at both sides) • spool types AA, CA, CB <p>Version without secondary valves vertical connection (standard) SC12-...-...-...-...-...-...-Y-...-X000/X000-A-V 0 Horizontal connection SC12-...-...-...-...-...-...-Z-...-X000/X000-A-V 0</p> <p>Version with secondary valves horizontal connection SC12-...-...-...-...-...-...-Z-...-K...-...-A-V 35 SC12-...-...-...-...-...-...-Z-...-L...-...-A-V 35 SC12-...-...-...-...-...-...-Z-...-N...-...-A-V 35 SC12-...-...-...-...-...-...-Z-...-S...-...-A-V 35</p>

SC12-.../...-3.../...-X00X-_-XX-.../...-A-V_



- hydraulic operation of the main spool. When not operated, centred in neutral position by springs.
- without electrical operation
- without manual operation
- control at a and b
- damping orifice (at both sides)
- spool types AA, BA, CA, CB, DA

Version without secondary valves
vertical connection (standard)

SC12-.../.../.../.../.../...-Y-...-X000/X000-A-V 0

Horizontal connection

SC12-.../.../.../.../.../...-Z-...-X000/X000-A-V 0

Version with secondary valves
horizontal connection

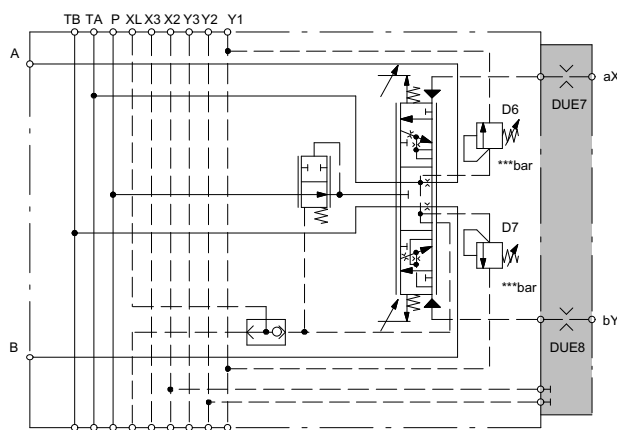
SC12-.../.../.../.../.../...-Z-...-K.../...-A-V 35

SC12-.../.../.../.../.../...-Z-...-L.../...-A-V 35

SC12-.../.../.../.../.../...-Z-...-N.../...-A-V 35

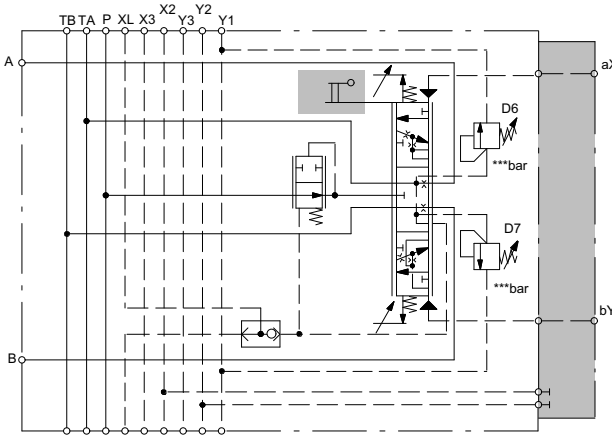
SC12-.../.../.../.../.../...-Z-...-S.../...-A-V 35

SC12-.../.../...-3.../...-X00X-D-XX-.../...-A-V 0

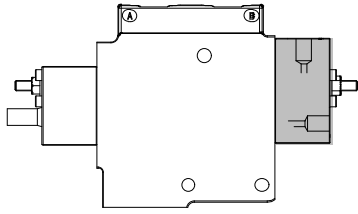
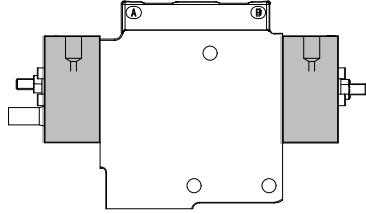
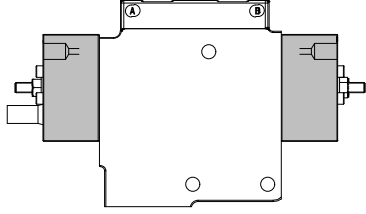


- hydraulic operation of the main spool (duo head: 1 cover with 2 ports). When not operated, centred in neutral position by springs.
- without electrical operation
- without manual operation
- control at a and b
- damping orifice (at both sides)
- spool types AA, BA, CA, CB, DA

4.6.3.3 Hydraulic and hand lever

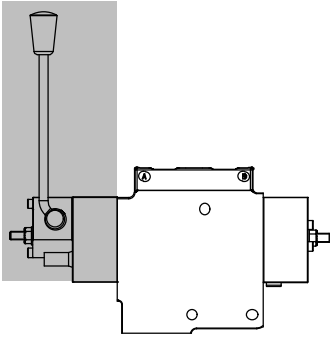
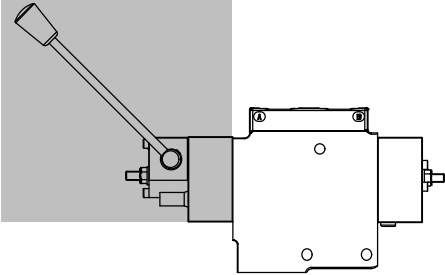
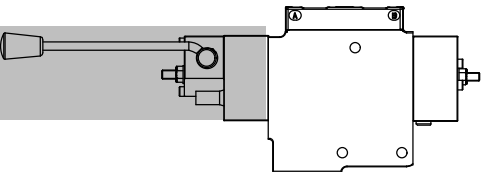
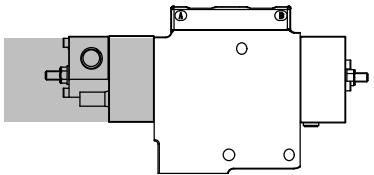
Type and symbol	Description
<p>SC12-.../.../...- 3.../...- X00X - D - _ _ -.../...- A - V 17</p>	
	<ul style="list-style-type: none"> • hydraulic operation of the main spool (Duo head: 1 cover with 2 ports). When not operated, centred in neutral position by springs. • without electrical operation • manual operation • follower-type hand lever: The mechanical operator can override the electro-hydraulic operation. The hand lever is directly connected to the main spool and follows the spool movement during electrohydraulic operation. • all lever positions can be supplied • control at a and b • without damping orifice • spool types AA, BA, CA, CB, DA <p>Version without secondary valves Manual operation (standard) SC12-.../.../.../.../.../.../...- H_- X000/X000 - A - V... Emergency manual operation (lever length: short) SC12-.../.../.../.../.../.../...- N_- X000/X000 - A - V...</p> <p>Version with secondary valves Manual operation (standard) SC12-.../.../.../.../.../.../...- H_- L.../...- A - V... SC12-.../.../.../.../.../.../...- H_- N.../...- A - V... SC12-.../.../.../.../.../.../...- H_- S.../...- A - V... Emergency manual operation (lever length: short) SC12-.../.../.../.../.../.../...- N_- L.../...- A - V... SC12-.../.../.../.../.../.../...- N_- N.../...- A - V... SC12-.../.../.../.../.../.../...- N_- S.../...- A - V...</p>

4.6.3.4 Orientation of the ports

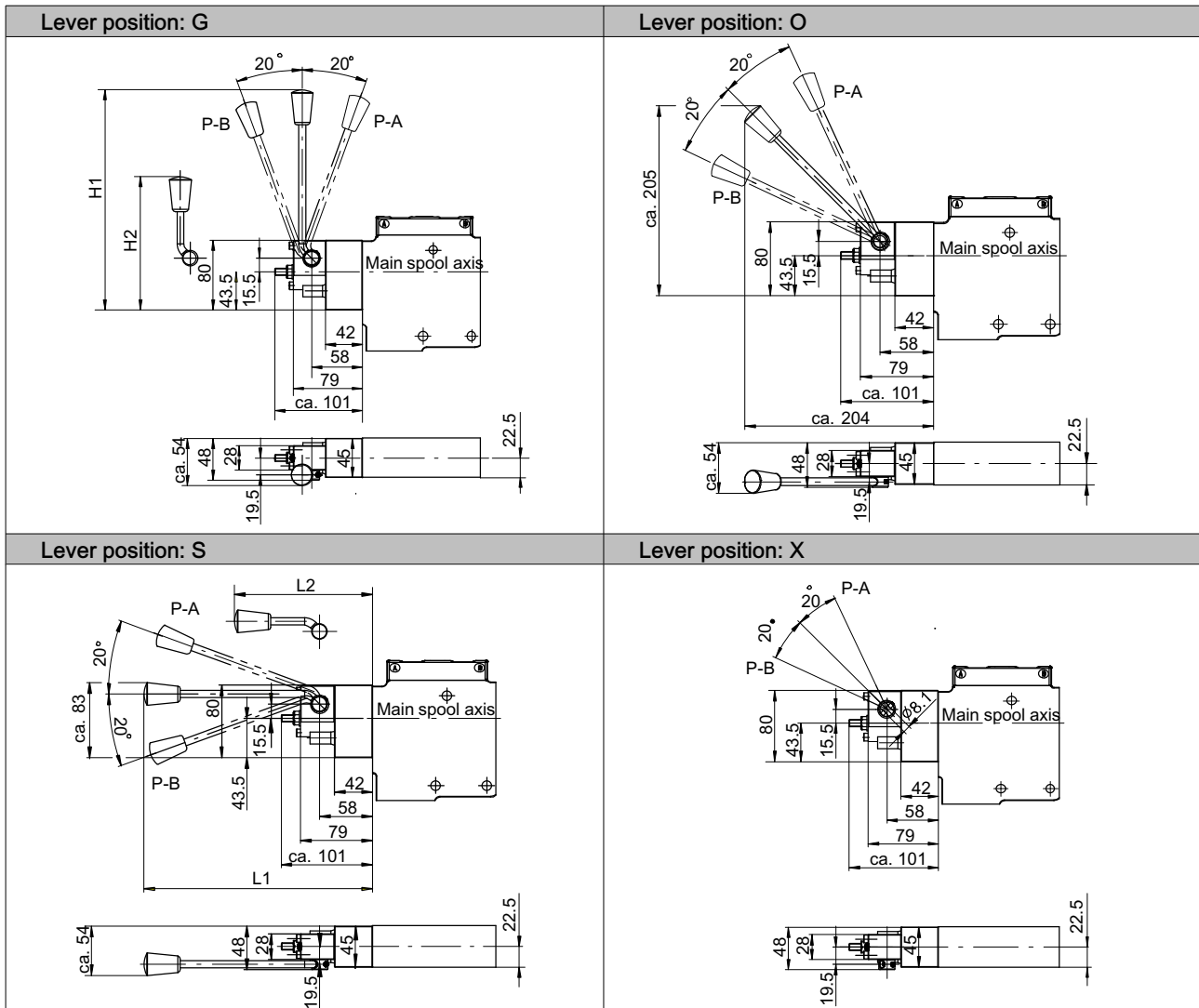
Type and symbol	Description
SC12-...-.../...-.../...-...- D -...-.../...- A - V...	
	<ul style="list-style-type: none"> • hydraulic operation • 1 cover with 2 ports
SC12-...-.../...-.../...-...- Y -...-.../...- A - V...	
	<ul style="list-style-type: none"> • hydraulic operation • 2 covers, each with 1 vertical port (standard)
SC12-...-.../...-.../...-...- Z -...-.../...- A - V...	
	<ul style="list-style-type: none"> • hydraulic operation • 2 covers, each with 1 horizontal port

4.6.5 Lever

4.6.5.1 Lever orientation

Type and symbol	Description
SC12-.../.../.../...- G -.../...-A-V... 	<ul style="list-style-type: none"> • manual operation • lever position G • cranked hand lever <p>Manual operation (standard) SC12-.../.../.../...-HG-.../...-A-V... Emergency manual operation (short lever) SC12-.../.../.../...-NG-.../...-A-V...</p>
SC12-.../.../.../...- O -.../...-A-V... 	<ul style="list-style-type: none"> • manual operation • lever position O • straight hand lever <p>Manual operation (standard) SC12-.../.../.../...-HO-.../...-A-V...</p>
SC12-.../.../.../...- S -.../...-A-V... 	<ul style="list-style-type: none"> • manual operation • lever position S • cranked hand lever <p>Manual operation (standard) SC12-.../.../.../...-HS-.../...-A-V... Emergency manual operation (short lever) SC12-.../.../.../...-NS-.../...-A-V...</p>
SC12-.../.../.../...- X -.../...-A-V... 	<ul style="list-style-type: none"> • manual operation • lever position X • without hand lever <p>Manual operation (standard) SC12-.../.../.../...-HX-.../...-A-V...</p>

4.6.5.2 Lever position



4.6.5.3 Total length

Ordering code	Cover height	
	H1	H2
SC12-...- HG -...	ca. 253	
SC12-...- NG -...		ca. 153

Ordering code	Cover length	
	L1	L2
SC12-...- HS -...	ca. 252	
SC12-...- NS -...		ca. 152

4.6.5.4 Operating force on hand lever

Type and symbol	Description
	<p>Operator: E30X-X-H_, E31X-X-H_, E32X-X-H_, E33X-X-H_, E34X-X-H_, E35X-X-H_, E36B-X-H_, E38X-X-H_, E39X-X-H_, E40X-X-H_, E41X-X-H_, E42X-X-H_, E43X-X-H_, X00X-D-H_, X00X-X-H_</p> <p>Maximum force: 40 N</p> <p>Operator: E30X-X-N_, E31X-X-N_, E32X-X-N_, E33X-X-N_, E34X-X-N_, E35X-X-N_, E36B-X-N_, E38X-X-N_, E39X-X-N_, E40X-X-N_, E41X-X-N_, E42X-X-N_, E43X-X-N_, X00X-D-N_</p> <p>Maximum force: 92 N</p>

4.7 Secondary valves

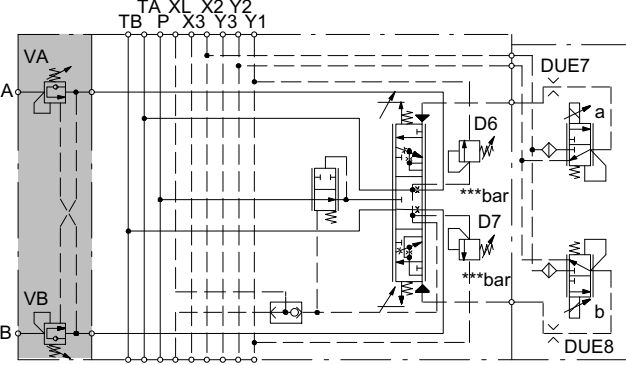
4.7.1 Without secondary valves

Type and symbol	Description
SC12-.../.../.../.../...- X000/X000 - A - V...	
	<ul style="list-style-type: none"> without secondary valves in A and B <p>Note: Secondary valves cannot be retrofitted.</p>

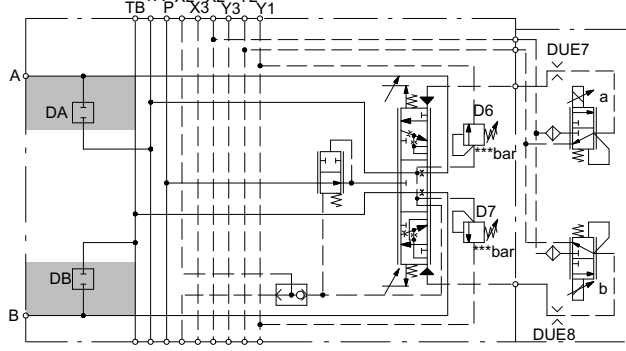
4.7.2 Valves with flange face (bolt-on plates)

4.7.2.1 Bolt-on plates – load-control valve

Type and symbol	Description
SC12-__A4-.../.../.../.../...- A - V... SC12- PBH - X000 - S*** - ___ - A - V...	
	<p>The bolt-on load-control valve, with integral anti-shock function, ensures load-independent lowering motion at speeds determined by the inlet flow, with leak-free shut-off when the directional valve is in its neutral position. Turning the adjusting screw in the clockwise direction reduces the setting, and this can also be used for emergency lowering of the load.</p> <ul style="list-style-type: none"> bolt-on plate load-control valve at actuator port B pressure setting in bar for load-control valve (3-digit) pilot ratio of the load-control valves = 3:1 $Q_{max} = 120 \text{ l/min}$ <p>Connection thread:</p> <ul style="list-style-type: none"> G04: port A and B: G3/4" U06: port A and B: 1 1/16-12UN <p>Note: The flange-mounted bolt-on plate is designed by Bucher Hydraulics.</p>

Type and symbol	Description
SC12- __ A4 -.../.../.../.../...- A - V... SC12- PBH - S*** - S*** - __ - A - V...	
	<p>These bolt-on load control valves with integral anti-shock function ensure load-independent lowering motion at speeds determined by the inlet flow, with leak-free shut-off when the directional valve is in its neutral position. Turning the adjusting screw in the clockwise direction reduces the setting, and this can also be used for emergency lowering of the load.</p> <ul style="list-style-type: none"> • bolt-on plate • load-control valve at actuator ports A and B • pressure setting in bar for load-control valve (3-digit) • pilot ratio of the load-control valves = 3:1 • ports A and B: G3/4" • $Q_{max} = 120 \text{ l/min}$ <p>Connection thread:</p> <ul style="list-style-type: none"> • G04: port A and B: G3/4" • U06: port A and B: 1 1/16-12UN <p>Note: The flange-mounted bolt-on plate is designed by Bucher Hydraulics.</p>

4.7.3 Sealing plug

Type and symbol	Description
SC12-.../.../.../.../...- S000/S000 - A - V...	
	<ul style="list-style-type: none"> • Sealing plug secondary valve (connection shut off) for actuator port A • Sealing plug secondary valve (connection shut off) for actuator port B <p>Secondary valves can be retrofitted.</p> <p>Note: For the A-side, the adjustable anti-shock valve with make-up cannot be combined with manual operation or with the separate load-sensing tapping.</p>

4.7.4 Secondary valves

Type and symbol	Description
<p>SC12-.../.../.../...- S000/K***- A - V...</p>	<ul style="list-style-type: none"> • sealing plug for secondary valve (connection: shut-off) for actuator port A • adjustable anti-shock valve with make-up for actuator port B • pressure setting in bar for actuator port B (3-digit) • for adjustable pressure ranges and characteristics, see Section 8 <p>Secondary valve (A-side) can be retrofitted.</p> <p>The secondary valve (B-side) is used for pressure relief of the actuator line to tank. On the secondary side, the valve protects the actuator from unacceptably large pressure peaks. The make-up function protects the actuator from cavitation.</p> <p>Caution: This anti-shock valve with make-up is only suitable for reducing pressure peaks, not for use as a main pressure relief valve.</p> <p>Note: For the A-side, the adjustable anti-shock valve with make-up cannot be combined with manual operation or with the separate load-sensing tapping.</p>
<p>SC12-.../.../.../...- N000/L***- A - V...</p>	<ul style="list-style-type: none"> • make-up valve for actuator port A • fixed-setting anti-shock valve with make-up for actuator port B • Pressure setting in bar for actuator port B (3-digit) • For pressure setting values and characteristics, see Section 8 <p>The secondary valve (A-side) protects the actuator from cavitation.</p> <p>The secondary valve (B-side) is used for pressure relief of the actuator line to tank. On the secondary side, the valve protects the actuator from unacceptably large pressure peaks. The make-up function protects the actuator from cavitation.</p> <p>Caution: This anti-shock valve with make-up is only suitable for reducing pressure peaks, not for use as a main pressure relief valve.</p> <p>Caution: The anti-shock valve with make-up has a fixed setting. The pressure setting is defined for a flow rate of 10 l/min.</p>

IMPORTANT!

The setting of the anti-shock valve must be 30 bar higher than the setting of the load-sensing pressure relief unit.

4.8 Ordering code

4.8.1 Ordering code for actuator module, Part 1

	SC	12	-	Y	3	G	3	-	D	330	/	S	000	-	3	CA
SC	Valve series															
12	Nominal size															
	Pressure compensator															
R	load-holding valve function															
T	without pressure compensator															
Y	pressure comp. without load-holding function															
Z	pressure comp. with load-holding function															
3	Actuator section number (max. 8; > 8 on application)															
	Connection type prepared with valves for bolt-on plate:															
A	port: Whitworth thread (ISO 1179 - Part 1) resp. without line connection															
B	port: UNF-thread (ISO 11926 Part - 1) Line connection:															
G	threaded port (ISO 1179-Part 1 G1/2")															
H	threaded port (ISO 1179-Part 1 G3/4")															
U	threaded port (ISO 11926-Part 1 7/8-14UNF)															
V	threaded port (ISO 11926-Part 1 1 1/16-12UN)															
	Open ports															
2	port A: plugged, port B: open															
3	port A: open, port B: open															
4	bolt-on plate (only in combination with connection type A resp. B)															
	Load sensing A (D6)															
D	primary pressure cut-off D6, (manual setting)															
S	sealing plug – primary-pressure cut-off, (connection shut off)															
T	venting plug – primary-pressure cut-off, (connection open)															
X	without primary-pressure cut-off D6, (valve cannot be retrofitted)															
	Pressure cut-off port A, primary [bar]															
000	without (only in combination with load sensing S, T or X)															
330	specify the required setting (e.g. 330 bar)															
	Load sensing B (D7)															
D	primary pressure cut-off D7, manual setting (load sensing B)															
G	primary pressure cut-off D7, manual setting (load sensing A and B)															
S	sealing plug – primary-pressure cut-off, (connection shut off)															
	Pressure cut-off port B, primary [bar]															
000	without (only in combination with load sensing S)															
330	specify the required setting															
	Spool position															
1	control at a															
3	control at a and b															
	Spool typt															
CA	specify required spool type, (e.g. CA)															

4.8.2 Ordering code for actuator module, Part 2

	130	130	A00	N	E35X	X	H	O	X	000	X	000	A	V0
Flow rate, port A specify the required flow rate (e.g. 130 l/min)														
Flow rate, port B specify the required flow rate (e.g. 130 l/min)														
Spool type data specified by Bucher Hydraulics														
Pressure compensator spring version: standard														
Electrical operation (for selection range, see Section 4.8.3) E35X electrical operation (example E35X) X00X without														
Hydraulic operation D duo head X without Y vertical connection (standard) Z horizontal connection														
Manual operation H manual operation (standard) N emergency manual operation (hand-lever: short) X without														
Lever position G hand-lever position G O hand-lever position O (only with manual operation H) S hand-lever position S X hand-lever position X (only with manual operation H, or when manual operation not present)														
Pressure relief / make up, secondary, A-side K adjustable anti-shock valve with make-up L fixed-setting anti-shock valve with make-up N make-up check valve S sealing plug for secondary valve (connection shut off) X secondary valves cannot be retrofitted														
Pressure setting, secondary, A-side [bar] 000 without (only in combination with secondary valve N, S or X) 320 specify the required setting (e.g. 320 bar) (for selection menu, see Section 8)														
Pressure relief / make up, secondary, B-side K adjustable anti-shock valve with make-up L fixed-setting anti-shock valve with make-up N make-up check valve S sealing plug for secondary valve (connection shut off) X secondary valves cannot be retrofitted														
Pressure setting, secondary, B-side [bar] 000 without (only in combination with secondary valve N, S or X) 320 specify the required setting (e.g. 320 bar) (for selection menu, see Section 8)														
Series identifier (data specified by Bucher Hydraulics)														
Option (for available options see section 4.8.4)														

4.8.3 Electrical operation

4.8.3.1 Electrohydraulic proportional, without displacement sensor

Manual emergency operation	Plug connector (solenoid)	Supply voltage 12 V	Supply voltage 24 V
without	DT04-2P	E34X	E35X
	AMP Junior Timer 2-pole	E30X	E31X
with	DT04-2P	E50X	E49X
	AMP Junior Timer 2-pole	E32X	E33X

4.8.3.2 Electrohydraulic proportional, with displacement sensor

Displacement sensor		Solenoid			
Plug connector	Supply voltage	Manual emergency operation	Plug connector	Supply voltage 12 V	Supply voltage 24 V
AMP Superseal 1,5 4-pole CA male	9 ... 32 VDC	without	DT04-2P	E34A	E35A
			AMP Junior Timer 2-pole	E30A	E31A
		with	DT04-2P	E50A	E49A
			AMP Junior Timer 2-pole	E32A	E33A

4.8.3.3 Onboard electronics (OBE), electrohydraulic actuator (EHA) with displacement sensor

Manual emergency operation	Plug connector (solenoid)	Supply voltage 12 V	Supply voltage 24 V
without	DT14-6P		E36B

4.8.3.4 Electrohydraulic on-off, without displacement sensor

Manual emergency operation	Plug connector (solenoid)	Supply voltage 12 V	Supply voltage 24 V
without	DT04-2P	E42X	E43X
	AMP Junior Timer 2-pole	E38X	E40X
with	AMP Junior Timer 2-pole	E39X	E41X

4.8.4 Options

- V0 Damping orifice in the operator (both sides)
- V7 Damping orifice in the operator (both sides), separate load-sensing tapping, port XLA: plugged, port XLB: plugged
- V13 The reduced pump pressure tap-off is plugged.
- V16 Damping orifice in the operator (both sides), test points for the pilot pressure: port Ma: plugged, port Mb: plugged
- V17 No damping orifice in the operator
- V20 No damping orifice in the operator, test points for the pilot pressure: port Ma: plugged, port Mb: plugged
- V23 Common load-sensing, A- and B-side: Port XL5: plugged
- V26 Stroke limiter (A-side) and stroke limiter (B-side) are both located on the A-side
- V31 Damping orifice in the operator (both sides), separate load-sensing tapping: Port XLA: plugged, port XLB: plugged, special position of port XLA
- V33 Damping orifice in the operator (both sides), test points for the pilot pressure: Port Ma: plugged, port Mb: plugged, special position of port Ma
- V34 No damping orifice in the operator, test points for the pilot pressure: Port Ma: plugged, port Mb: plugged, special position of port Ma
- V35 Damping orifice in the operator (both sides), special position of the port aX
- V36 No damping orifice in the operator, special position of the port aX
- V37 Damping orifice in the operator (both sides), electroproportional pressure relief with falling characteristic curve
- V38 Damping orifice in the operator (both sides), electroproportional pressure relief with rising characteristic curve

- V43 Damping orifice in the operator (both sides), without stroke limiter for the main spool
- V48 Damping orifice in the operator (both sides), without stroke limiter for the main spool, test points for the pilot pressure: port Ma: plugged, port Mb: plugged
- V49 Damping orifice in the operator (both sides), without stroke limiter for the main spool, test points for the pilot pressure: port Ma: plugged, port Mb: plugged, special position of the port Ma.

Port	Port thread			
	G	H	U	V
Ma	G1/4"		9/16-18UNF	
Mb				
XLA				
XLB				
XL5				

Combinations of different options (e.g. V7 and V37) are possible. When ordering, they are specified individually in the ordering code and later replaced by a single option number by Bucher Hydraulics .

4.8.5 Ordering code for bolt-on plate – load-control valve



4.8.5.1 Options

- V0 Standard

4.9 Dimensions

4.9.1 Dimensions of valve-body variants

4.9.1.1 Dimensions of valve-body variants, part 1

Type and dimensions	Type and dimensions
Version without secondary valves SC12-__ 4 __-.../.../...-X000/X000 - A - V...	Version without secondary valves SC12-__ 2 __-.../.../...-X000/X000 - A - V.. SC12-__ 3 __-.../.../...-X000/X000 - A - V..
	<p>ca. 157</p> <p>ca. 155</p> <p>93 36 0</p> <p>10</p> <p>17 74 61</p> <p>136</p> <p>A-side B-side</p> <p>Main spool axis</p> <p>= only for SC12-PBH-S</p>

4.9.1.2 Port sizes, part 1

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12-__ G __-...	A, B	Actuator	G1/2"	
SC12-__ H __-...	A, B	Actuator	G3/4"	
SC12-__ U __-...	A, B	Actuator		7/8-14UNF
SC12-__ V __-...	A, B	Actuator		1 1/16-12UN

4.9.1.3 Dimensions of valve-body variants, part 2

Version with secondary valves	Version with secondary valves
SC12-__4-.../.../...-K***/...-A-V...	SC12-__2-.../.../...-K***/...-A-V...
SC12-__4-.../.../...-L***/...-A-V...	SC12-__2-.../.../...-L***/...-A-V...
SC12-__4-.../.../...-N000/...-A-V...	SC12-__2-.../.../...-N000/...-A-V...
SC12-__4-.../.../...-S000/...-A-V...	SC12-__2-.../.../...-S000/...-A-V...
	SC12-__3-.../.../...-K***/...-A-V...
	SC12-__3-.../.../...-L***/...-A-V...
	SC12-__3-.../.../...-N000/...-A-V...
	SC12-__3-.../.../...-S000/...-A-V...

A-side	B-side	A-side	B-side

■ = only for SC12-PBH-S

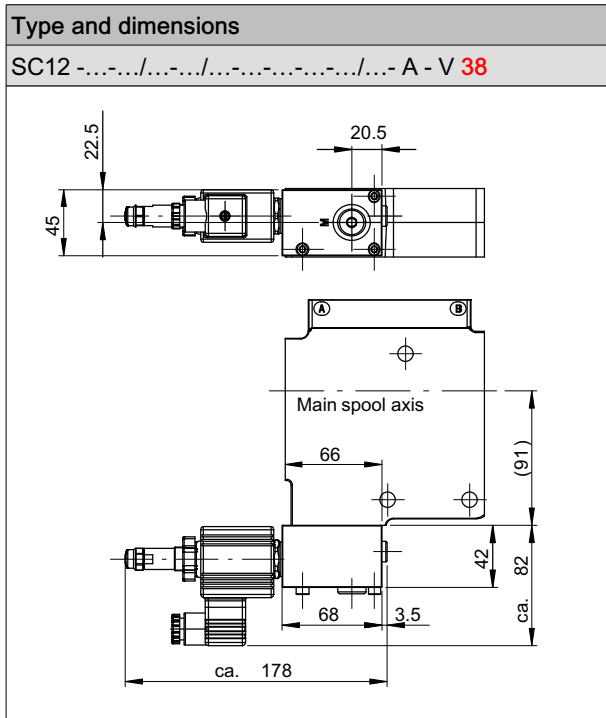
4.9.1.4 Total length, part 2

Ordering code	Valve height	Valve length
	H1	L9
SC12-...-K***/...		ca. 172
SC12-...-L***/...		ca. 145
SC12-...-N000/...		ca. 144
SC12-...-S000/...		ca. 141
SC12-...-.../K***	ca. 200	
SC12-...-.../L***	ca. 173	
SC12-...-.../N000	ca. 172	
SC12-...-.../S000	ca. 169	

4.9.1.5 Port sizes, part 2

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12-__G-...	A, B	Actuator	G1/2"	
SC12-__H-...	A, B	Actuator	G3/4"	
SC12-__U-...	A, B	Actuator		7/8-14UNF
SC12-__V-...	A, B	Actuator		1 1/16-12UN

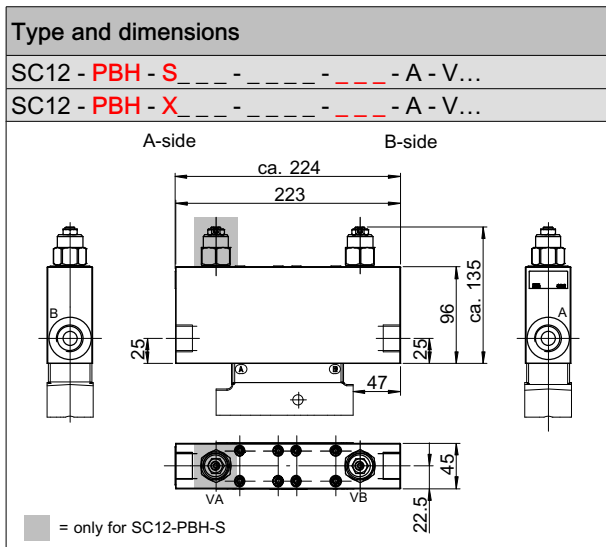
4.9.2.3 Dimensions of primary-pressure cut-off, part 2



4.9.2.4 Port sizes, part 2

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- ... - V 38	M	Test point	G1/4"	9/16-18UNF

4.9.3 Dimensions bolt-on plates



4.9.3.1 Port sizes

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- PBH - ... - G04 - ...	A, B	Actuator	G3/4"	
SC12- PBH - ... - U06 - ...	A, B	Actuator		1 1/16-12UN

4.9.4 Types of operation

4.9.4.1 Dimensions, types of operation, part 1

Type and dimensions	Type and dimensions
SC12-.../.../...- 1.../...- E__X-X-XX -.../...- A - V 0 SC12-.../.../...- 1.../...- E__X-X-XX -.../...- A - V 17	SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 0 SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 17
Type and dimensions	Type and dimensions
SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 16 SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 20	SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 33 SC12-.../.../...- 3.../...- E__X-X-XX -.../...- A - V 34

4.9.4.2 Total length, part 1

				Valve length		Cover length	
				L1	L3	L2	L4
E30X	E31X	E32X	E33X	ca. 309	ca. 314	ca. 104	ca. 109
E34X	E35X			ca. 317	ca. 322	ca. 112	ca. 117
E38X	E39X	E40X	E41X	ca. 301	ca. 308	ca. 96	ca. 103
E42X	E43X			ca. 314	ca. 319	ca. 109	ca. 114
E49X	E50X			ca. 317	ca. 322	ca. 112	ca. 117

4.9.4.3 Port sizes, part 1

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- ... - V 16	Ma, Mb	Test point	G1/4"	9/16-18UNF
SC12- ... - V 20				
SC12- ... - V 33				
SC12- ... - V 34				

4.9.4.4 Dimensions, types of operation, part 2

Type and dimensions	Type and dimensions
SC12-...-...-3...-...-E--X-D-X-X-...-...-A-V 0 SC12-...-...-3...-...-E--X-D-X-X-...-...-A-V 17	SC12-...-...-3...-...-E--X-X-H-...-...-A-V 0 SC12-...-...-3...-...-E--X-X-H-...-...-A-V 17 SC12-...-...-3...-...-E--X-X-N-...-...-A-V 0 SC12-...-...-3...-...-E--X-X-N-...-...-A-V 17
Type and dimensions	Type and dimensions
SC12-...-...-3...-...-E--B-X-XX-...-...-A-V 43	SC12-...-...-3...-...-E36B-X-XX-...-...-A-V 48

4.9.4.5 Total length, part 2

				Valve length		Cover length	
				L5	L7	L6	L8
E30X	E31X	E32X	E33X	ca. 319	ca. 346	ca. 114	ca. 109
E34X	E35X			ca. 327	ca. 354	ca. 122	ca. 117
E38X	E39X	E40X	E41X	ca. 313	ca. 340	ca. 108	ca. 103
E42X	E43X			ca. 324	ca. 351	ca. 119	ca. 114
E49X	E50X			ca. 327	ca. 354	ca. 122	ca. 117

4.9.4.6 Port sizes, part 2

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- ... - V 48	Ma, Mb	Test point	G1/4"	9/16-18UNF
SC12- ... - D - ...	aX, bY	Pilot oil		

4.9.4.7 Dimensions, types of operation, part 3

Type and dimensions	Type and dimensions
<p>SC12-...-...-...-3...-...-E36B - X - XX -...-...- A - V 49</p>	<p>SC12-...-...-...-3...-...-E36B - D - XX -...-...- A - V 43</p>
<p>SC12-...-...-...-3...-...-E36B - X - X - H_...-...- A - V26 SC12-...-...-...-3...-...-E36B - X - X - N_...-...- A - V26</p>	<p>SC12-...-...-...-3...-...-E_ A - X - X - X -...-...- A - V43</p>

4.9.4.8 Port sizes, part 3

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- ... - V 49	Ma, Mb	Test point	G1/4"	9/16-18UNF
SC12- ... - D - ...	aX, bY	Pilot oil		

4.9.4.9 Dimensions, types of operation, part 4

Type and dimensions	Type and dimensions
SC12-...-...-...-1...-...-X00X-Y-XX-...-...-A-V 0 SC12-...-...-...-1...-...-X00X-Y-XX-...-...-A-V 17	SC12-...-...-...-1...-...-X00X-Z-XX-...-...-A-V 0 SC12-...-...-...-1...-...-X00X-Z-XX-...-...-A-V 17
Type and dimensions	Type and dimensions
SC12-...-...-...-3...-...-X00X-Y-XX-...-...-A-V 0 SC12-...-...-...-3...-...-X00X-Y-XX-...-...-A-V 17	SC12-...-...-...-3...-...-X00X-Z-XX-...-...-A-V 0 SC12-...-...-...-3...-...-X00X-Z-XX-...-...-A-V 17

4.9.4.10 Port sizes, part 4

Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12-...-...-1-...	aX	Pilot oil	G1/4"	9/16-18UNF
SC12-...-...-3-...	aX, bY	Pilot oil		

4.9.4.11 Dimensions, types of operation, part 5

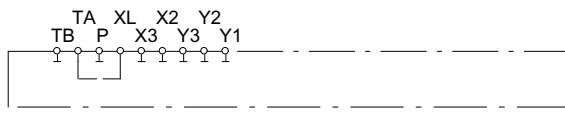
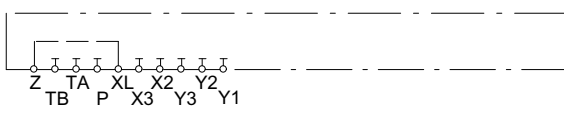
Type and dimensions	Type and dimensions
SC12-...-...-3...-...-X00X-Z-XX-...-...-A-V 35 SC12-...-...-3...-...-X00X-Z-XX-...-...-A-V 36	SC12-...-...-3...-...-X00X-D-XX-...-...-A-V 0 SC12-...-...-3...-...-X00X-D-XX-...-...-A-V 17
Type and dimensions	Type and dimensions
SC12-...-...-3...-...-X00X-D-H-...-...-A-V 0 SC12-...-...-3...-...-X00X-D-H-...-...-A-V 17 SC12-...-...-3...-...-X00X-D-N-...-...-A-V 0 SC12-...-...-3...-...-X00X-D-N-...-...-A-V 17	SC12-...-...-3...-...-X00X-X-H-...-...-A-V 17 SC12-...-...-3...-...-X00X-X-N-...-...-A-V 17

4.9.4.12 Port sizes, part 5

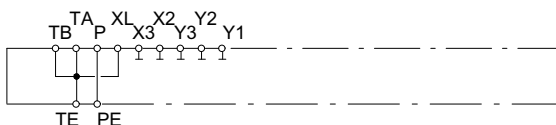
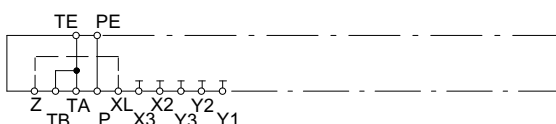
Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12- ... - D - ...	aX, bY	Pilot oil	G1/4"	9/16-18UNF
SC12- ... - Z - ...				

5 End module

5.1 End module (no control function)

Type and symbol	Description
SC12- EX - 00 - A - V 0 SC12- EY - 00 - A - V 0	
<p>End module (right)</p> 	<ul style="list-style-type: none"> no control function <p>Module type:</p> <ul style="list-style-type: none"> E: end module (right) EA: end module (left)
SC12- EAX - 00 - A - V 0 SC12- EAY - 00 - A - V 0	<p>Port threads:</p> <ul style="list-style-type: none"> X: mounting thread: M10 Y: mounting thread: 3/8-16UNC
<p>End module (left)</p> 	<p>End module (left) SC12-EA_... only in combination with</p> <ul style="list-style-type: none"> Inlet module SC12-E_... - ... - A - V ...

5.2 End module with additional P and T ports

Type and symbol	Description
SC12- EG - 11 - A - V 2 SC12- EU - 11 - A - V 2	
<p>End module (right)</p> 	<ul style="list-style-type: none"> tank bridge <p>Module type:</p> <ul style="list-style-type: none"> E: End module (right) EA: End module (left)
SC12- EAG - 11 - A - V 2 SC12- EAU - 11 - A - V 2	<p>Port thread G:</p> <ul style="list-style-type: none"> PE = G1": open TE = G1": open
<p>End module (left)</p> 	<p>Port thread U:</p> <ul style="list-style-type: none"> PE = 1 5/16-12UN: open TE = 1 5/16-12UN: open <p>End module (left) SC12-EA_... only in combination with</p> <ul style="list-style-type: none"> Inlet module SC12-E_... - ... - A - V ...

5.3 End module with additional XL1 port

Type and symbol	Description
SC12- EFG - 00 - A - V 0 SC12- EFU - 00 - A - V 0	
<p style="text-align: center;">End module (right)</p>	<p>Module type:</p> <ul style="list-style-type: none"> EF = end module (right) <p>Port thread G:</p> <ul style="list-style-type: none"> XL1 = G1/4": open <p>Port thread U:</p> <ul style="list-style-type: none"> XL1 = 9/16-18UNF: open <p>Note:</p> <p>To unload the load sensing signal via port XL1, external means must be used.</p>

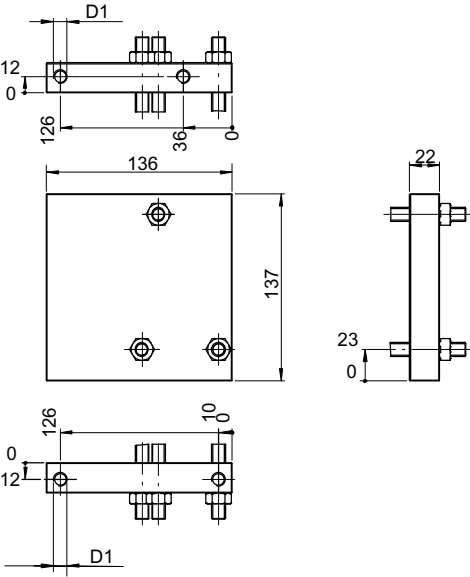
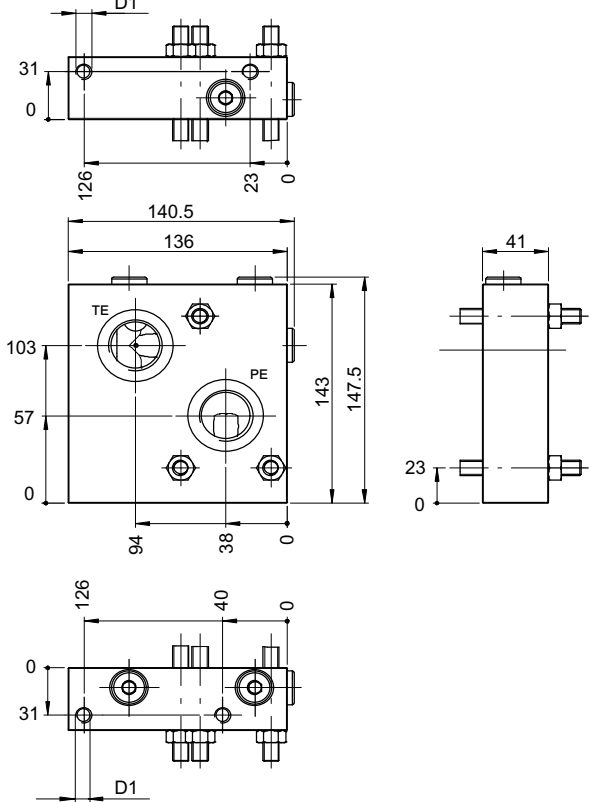
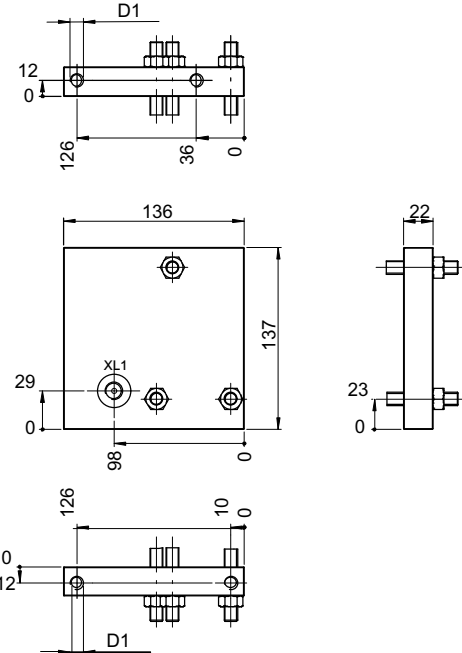
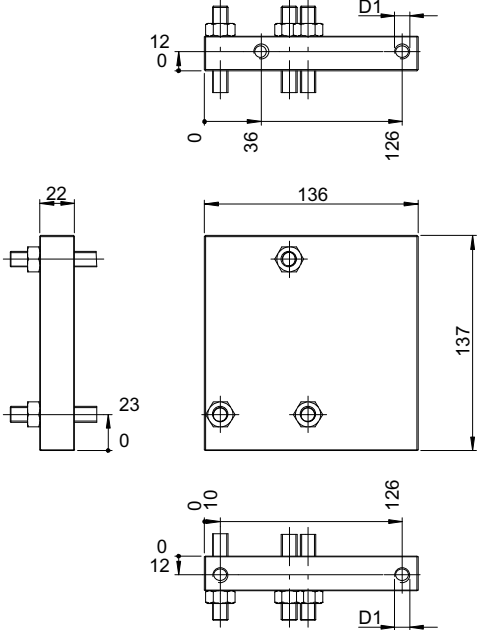
5.4 Ordering code

	SC	12	E	G	0	0	A	V0
SC	Valve series							
12	Nominal size							
E	Module variant end module (right) port XL1 not present							
EA	end module (left) port XL1 not present							
EF	end module (right), additional port XL1: open							
G	Connection type thread (ISO 1179-Part 1 Whitworth pipe thread)							
U	thread (ISO 11926-Part 1 UNF thread)							
X	ports not present (mounting: M10)							
Y	ports not present (mounting: 3/8-16UNC)							
0	Port P not present							
1	open							
2	plugged							
0	Port T not present							
1	open							
2	plugged							
	Series identifier (data specified by Bucher Hydraulics)							
...	Option for available options, see Section 5.4.1							

5.4.1 Options

- V0 no control function
- V2 additional P and T ports

5.5 Dimensions

Type and dimensions	Type and dimensions
<p data-bbox="188 338 438 389">SC12- EX - 00 - A - V 0 SC12- EY - 00 - A - V 0</p> 	<p data-bbox="837 338 1088 389">SC12- EG - 11 - A - V 2 SC12- EU - 11 - A - V 2</p> 
Type and dimensions	Type and dimensions
<p data-bbox="188 1301 454 1352">SC12- EFG - 00 - A - V 0 SC12- EFU - 00 - A - V 0</p> 	<p data-bbox="837 1301 1104 1352">SC12- EAX - 00 - A - V 0 SC12- EAY - 00 - A - V 0</p> 

5.5.1 Port sizes

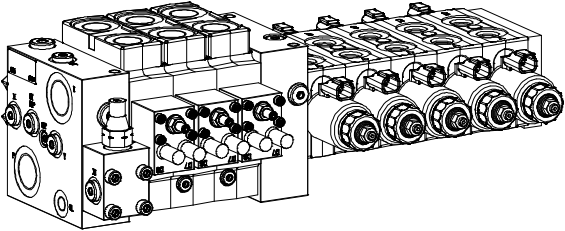
Ordering code	Port		ISO 1179 Part 1	ISO 11926 Part 1
SC12-...- V 2	PE	Pump	G1"	1 5/16-12UN
	TE	Tank		
SC12- EF _- ...	XL1	Load sensing external actuator	G1/4"	9/16-18UNF

5.5.2 Mounting thread

Ordering code	Mounting	
	D1	Depth
SC12-...- EAX -... SC12-...- EFG -... SC12-...- EG -... SC12-...- EX -...	M10	17
SC12-...- EAY -... SC12-...- EFU -... SC12-...- EU -... SC12-...- EY -...	3/8-16UNC	16

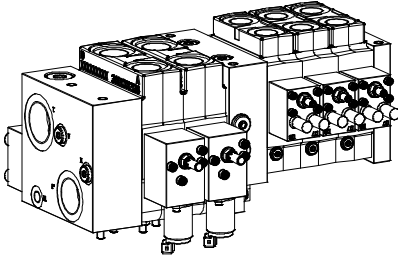
6 Special modules

6.1 Combination with L.8S series

	<p>Description</p> <p>Series L.8S:</p> <ul style="list-style-type: none"> Maximum actuator flow: 90 l/min Maximum pump pressure: 315 bar Maximum load pressure: 315 bar Maximum tank pressure: 40 bar <p>Note:</p> <p>The combination with the L.8S series is designed by Bucher Hydraulics.</p>
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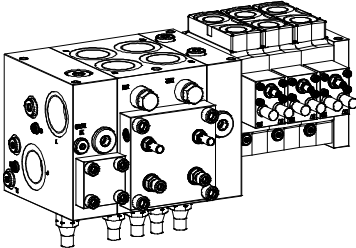
For the proportional directional valve series L.8S, see data sheet 100-P-000047.

6.2 Combination with SC18 series

	<p>Description</p> <p>Series SC18:</p> <ul style="list-style-type: none"> Maximum actuator flow: 260 l/min Maximum pump pressure: 370 bar Maximum load pressure: 420 bar Maximum tank pressure: 50 bar <p>Note:</p> <p>The combination with the SC18 series is designed by Bucher Hydraulics.</p>
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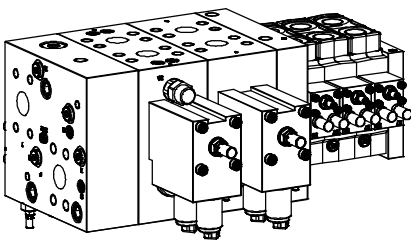
For the sectional proportional directional valve system series SC18, see data sheet 301-P-9050089.

6.3 Combination with SC22 series

	<p>Description</p> <p>Series SC22:</p> <ul style="list-style-type: none"> Maximum actuator flow: 340 l/min Maximum pump pressure: 370 bar Maximum load pressure: 420 bar Maximum tank pressure: 50 bar <p>Note:</p> <p>The combination with the SC22 series is designed by Bucher Hydraulics.</p>
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For the sectional proportional valve series SC22, see data sheet 301-P-9050084.

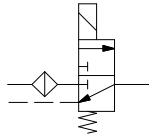
6.4 Combination with SVC25 series

	<p>Description</p> <p>Series SVC25:</p> <ul style="list-style-type: none"> Maximum actuator flow: 500 l/min Maximum pump pressure: 370 bar Maximum load pressure: 420 bar Maximum tank pressure: 50 bar <p>Note:</p> <p>The combination with the SVC25 series is designed by Bucher Hydraulics.</p>
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For the sectional proportional valve series SVC25, see data sheet 301-P-9050085.

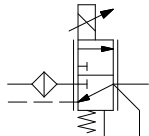
7 Solenoid valves

7.1 Electrohydraulic pilot valves, on-off



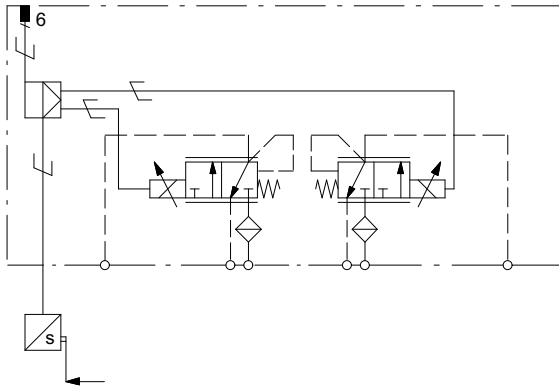
General characteristics	Unit	Ordering code		
		Actuator module (electrical operation)		Inlet module (option)
		E38X	E40X	V13
		E39X	E41X	V19
		E42X	E43X	V25
Supply voltage	V DC	12	24	24
Protection class to EN 60529		up to IP6K6 / IPX7 / IPX9K		
Coil resistance at 20 °C	Ω	8,15 ± 5%	32,5 ± 5%	32,5 ± 5%
Duty cycle		100%		
Switching time				
t _{on}	ms	< 60		
t _{off}	ms	< 100		
Electrical connection		see ordering code		

7.2 Electrohydraulic pilot valves, proportional



General characteristics	Unit	Ordering code			
		(electrical operation)			
		E30A	E30X		E31X
		E32A	E32X		E33X
		E34A	E34X		E35X
		E50A	E50X		E49X
Supply voltage	V DC	12		24	
Control current at opening point	mA	660		330	
Control current at max. stroke	mA	1360		680	
PWM frequency (recommended) The PWM frequency should be optimised to suit the application and operating conditions.	Hz	100			
Protection class to EN 60529		IP 65			
Insulation class to VDE 0580		H			
Coil resistance at 20 °C	Ω	5,3 ± 5%		21,2 ± 5%	
Coil resistance at 60 °C	Ω	6,1 ± 5%		24,5 ± 5%	
Power consumption at maximum stroke of the main valve spool (coil resistance at 60 °C)	VA	10,4			
Maximum current for 100% relative duty cycle:	mA	1500		750	
Electrical connection		see ordering code			

7.3 Onboard electronics: electrohydraulic actuator (EHA)



General characteristics	Unit	Ordering code (electrical operation)
		E36B
Supply voltage	V DC	24
Electrical connection		DT14-6P

For electrohydraulic actuator, see data sheet 100-P-000230.

7.4 Directional valves

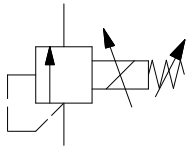
General characteristics	Unit	Ordering code (option)						
		Inlet module						
		V8	V9	V12	V24	V1	V10	V24
Symbol								
Type		2/2 directional valve (seat valve)				3/2 directional valve (spool valve)		
Manual override		without				with		
Supply voltage		24						
Protection class to EN 60529		IP65						
Duty cycle	%	100						
Electrical connection		3-pin square plug to DIN EN 175301-803 (standard)						
		Note: Mating plugs are not included in the delivery.						

2/2 cartridge seat valve, size 3 (series WSP22GNA3.../WSP22ONA3...), see data sheet 400-P-120801.

3/2 cartridge spool valve, size 3 (series WKP32GNA3.../WKP32ONA3...), see data sheet 400-P-120821.

7.5 Proportional pressure relief valves

7.5.1 Pressure relief valve (falling characteristic)



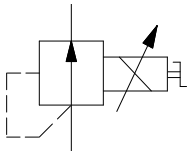
General characteristics	Unit	Ordering code (option)	
		Inlet module	Actuator module
		V5	V37
Supply voltage	V DC	24	
Control current	mA	0 ... 800	
Power consumption at maximum control current	W	max. 17,5	
PWM frequency (recommended)	Hz	200	
Protection class to EN 60529		IP 65	
Coil resistance at 20 °C	Ω	17,2	
Duty cycle:	%	100	
Electrical connection		3-pin square plug to DIN EN 175301-803 (standard) Note: Mating plugs are not included in the delivery.	

For inverse proportional pressure relief cartridge NG2 ... 4 (series DBDTC-1G...), see data sheet 400-P-585211.

Note:

The proportional pressure relief valve is not suitable for relieving a load signal.

7.5.2 Pressure relief valve (rising characteristic)



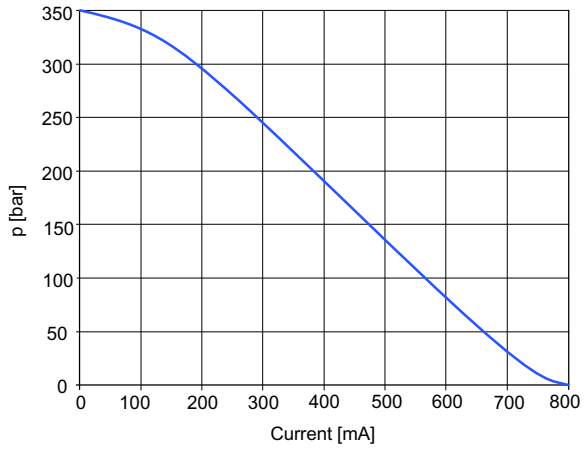
General characteristics	Unit	Ordering code (option)	
		Inlet module	Actuator module
		V6	V38
Supply voltage	V DC	24	
Control current	mA	0 ... 800	
Power consumption at maximum control current	W	max. 17,5	
PWM frequency (recommended)	Hz	200	
Protection class to EN 60529		IP 65	
Coil resistance at 20 °C	Ω	17,2	
Duty cycle:	%	100	
Electrical connection		3-pin square plug to DIN EN 175301-803 (standard) Note: Mating plugs are not included in the delivery.	

For proportional pressure relief cartridge NG2 ... 4 (type series DBDTC-1L...), see data sheet 400-P-585111.

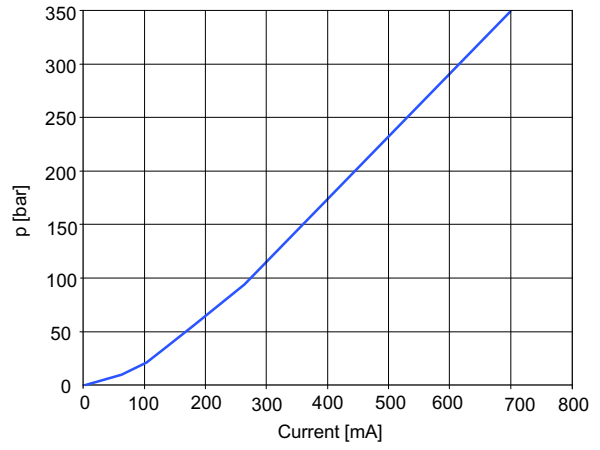
Note:

The proportional pressure relief valve is not suitable for relieving a load signal.

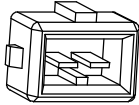
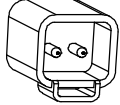
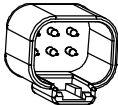
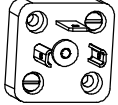
7.5.3 Pressure adjustment characteristic DBDTC-1LG



7.5.4 Pressure adjustment characteristic DBDTC-1L



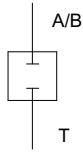
7.6 Connector-socket type

AMP Junior Timer 2-pole	DT04-2P	DT14-6P	DIN EN 175301-803
			
2-pin	2-pin	6-pin	3-pin

Note:
Mating plugs are not included in the delivery.

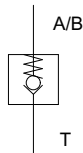
8 Secondary valves (technical data)

8.1 Valve type S: Sealing plug



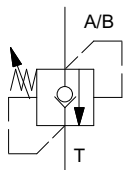
Type and Dimension	Ordering code
SC12-.../.../.../.../...- S000 /...- A - V...	
SC12-.../.../.../.../.../ S000 - A - V...	
	200778400310

8.2 Valve type N: Make-up check valve



Type and Dimension	Ordering code
SC12-.../.../.../.../...- N000 /...- A - V...	
SC12-.../.../.../.../.../ N000 - A - V...	
	301RC017926

8.3 Valve type K: Adjustable anti-shock valve with make-up



Type and Dimension	Pressure range	Ordering code
SC12-.../.../.../.../...- K*** /...- A - V...	[bar]	
SC12-.../.../.../.../.../ K*** - A - V...		
	010 - 070	301RC017919
	071 - 130	301RC017920
	131 - 210	301RC017921
	211 - 280	301RC017922
	281 - 350	301RC017923
351 - 420	301RC017924	

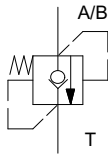
Caution:

Only suitable for reducing pressure peaks; not suitable as a pressure relief valve.

IMPORTANT:

The setting of the anti-shock valve must be 30 bar higher than the setting of the load-sensing pressure relief unit.

8.4 Valve type L: Fixed-setting anti-shock valve with make-up



Type and Dimension	Pressure range	Ordering code
SC12-.../.../.../.../.../... L ^{***} /...-A-V...	[bar]	
SC12-.../.../.../.../.../.../ L ^{***} -A-V...		
<p>10 $Ma = 35 \pm 10\% \text{ [Nm]}$</p>	40 ± 4	200533930068
	60 ± 4	200533930077
	70 ± 4	200533930118
	80 ± 6	200533930050
	90 ± 6	200533930084
	100 ± 6	200533930100
	110 ± 6	200533930110
	120 ± 6	200533930085
	130 ± 6	200533930057
	140 ± 8	200533930059
	150 ± 8	200533930051
	160 ± 8	200533930067
	170 ± 8	200533930071
	180 ± 8	200533930056
	190 ± 8	200533930113
	200 ± 8	200533930060
	210 ± 8	200533930080
	220 ± 10	200533930064
	230 ± 10	200533930058
	240 ± 10	200533930081
	250 ± 10	200533930052
	260 ± 10	200533930065
270 ± 10	200533930066	
280 ± 10	200533930053	
290 ± 12	200533930069	
300 ± 12	200533930079	
320 ± 12	200533930054	
340 ± 12	200533930055	
380 ± 15	200533930083	
<p>16 $Ma = 35 \pm 10\% \text{ [Nm]}$</p>	400 ± 15	301RC017974
	420 ± 15	301RC017975

Caution:
Only suitable for reducing pressure peaks; not suitable as a pressure relief valve.

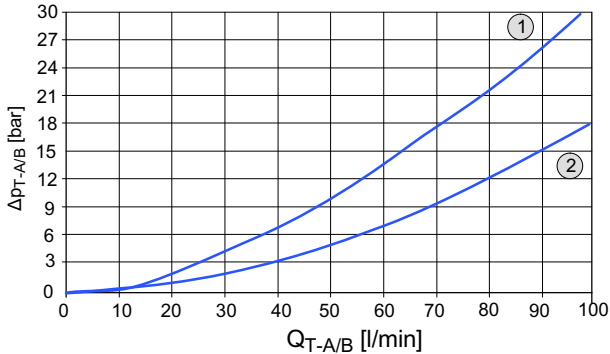
Caution:
Valve has a fixed setting.
The pressure setting is defined for a flow rate of 10 l/min.

IMPORTANT:
The setting of the anti-shock valve must be 30 bar higher than the setting of the load-sensing pressure relief unit.

8.5 Performance graphs

8.5.1 Anti-cavitation function

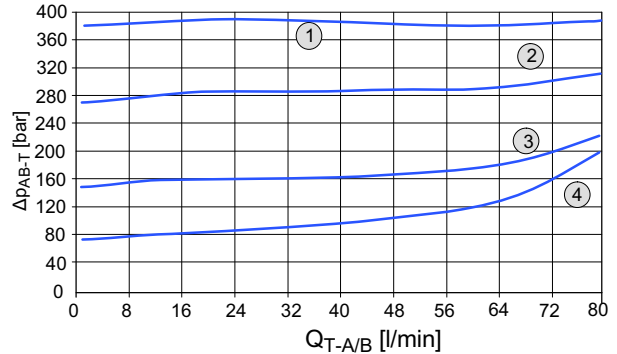
Q = actuator flow T -> A/B
 Δp = tank pressure - actuator pressure



Graph	Valve type
1	K, L
2	N

8.5.2 Anti-shock function

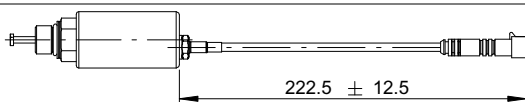
Q = actuator flow A/B -> T
 Δp = actuator pressure - tank pressure



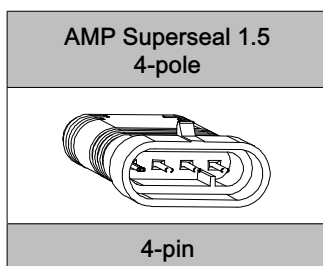
Graph	Pressure range [bar]
1	380
2	280
3	160
4	80

9 Sensors

9.1 Displacement sensor

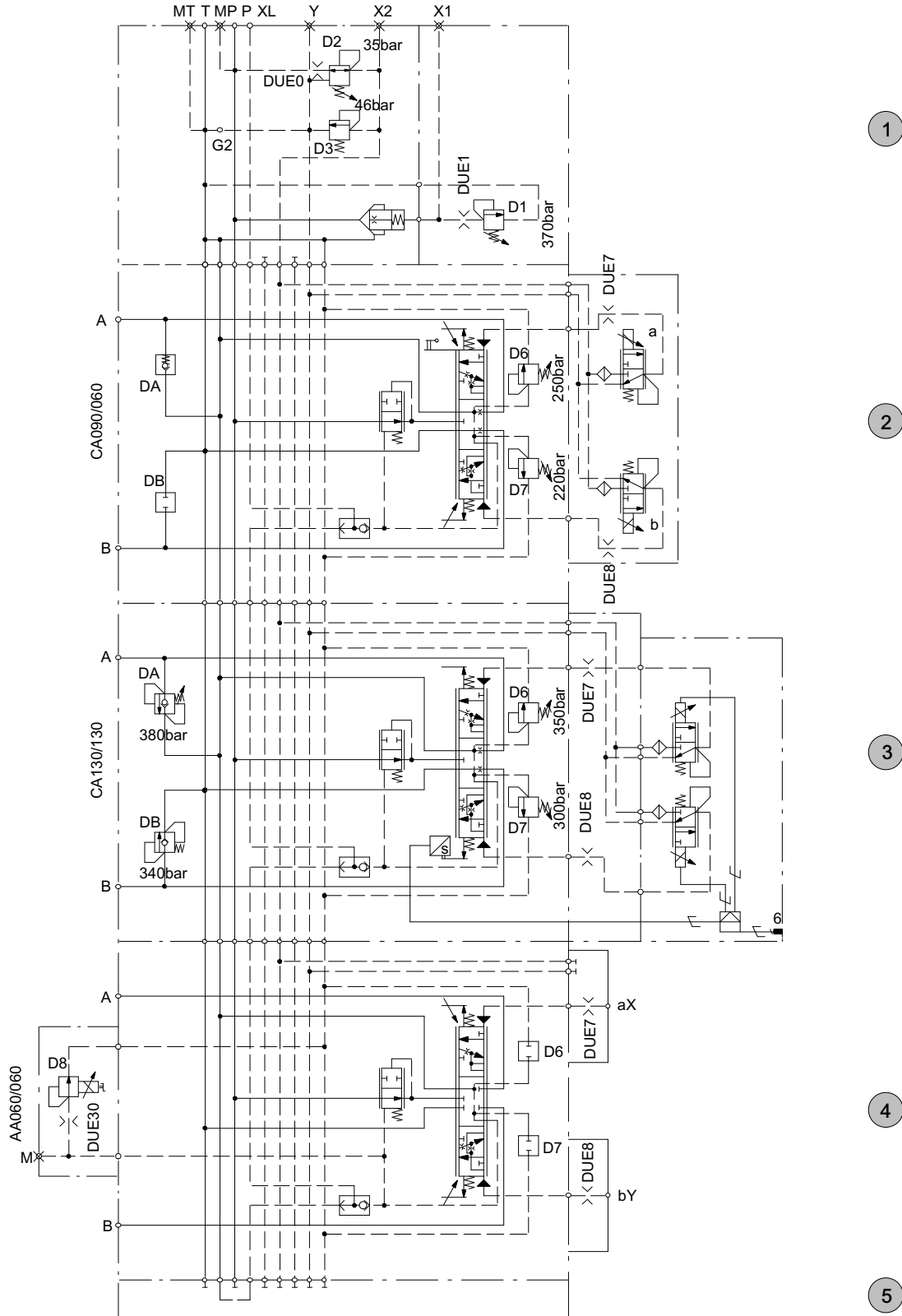
General characteristics	Unit	Ordering code (electrical operation)
		E__A
Voltage type		Direct voltage
Supply voltage	V	9 ... 32
Output signal	mA	4 ... 20
Protection class		IP 69 / IP6K9K
Load-cycles		10 Mio. Zyklen
Electrical connection		AMP Superseal 1,5 4P CA male
Cable length (incl. plug)		 222.5 ± 12.5

9.2 Connector-socket type



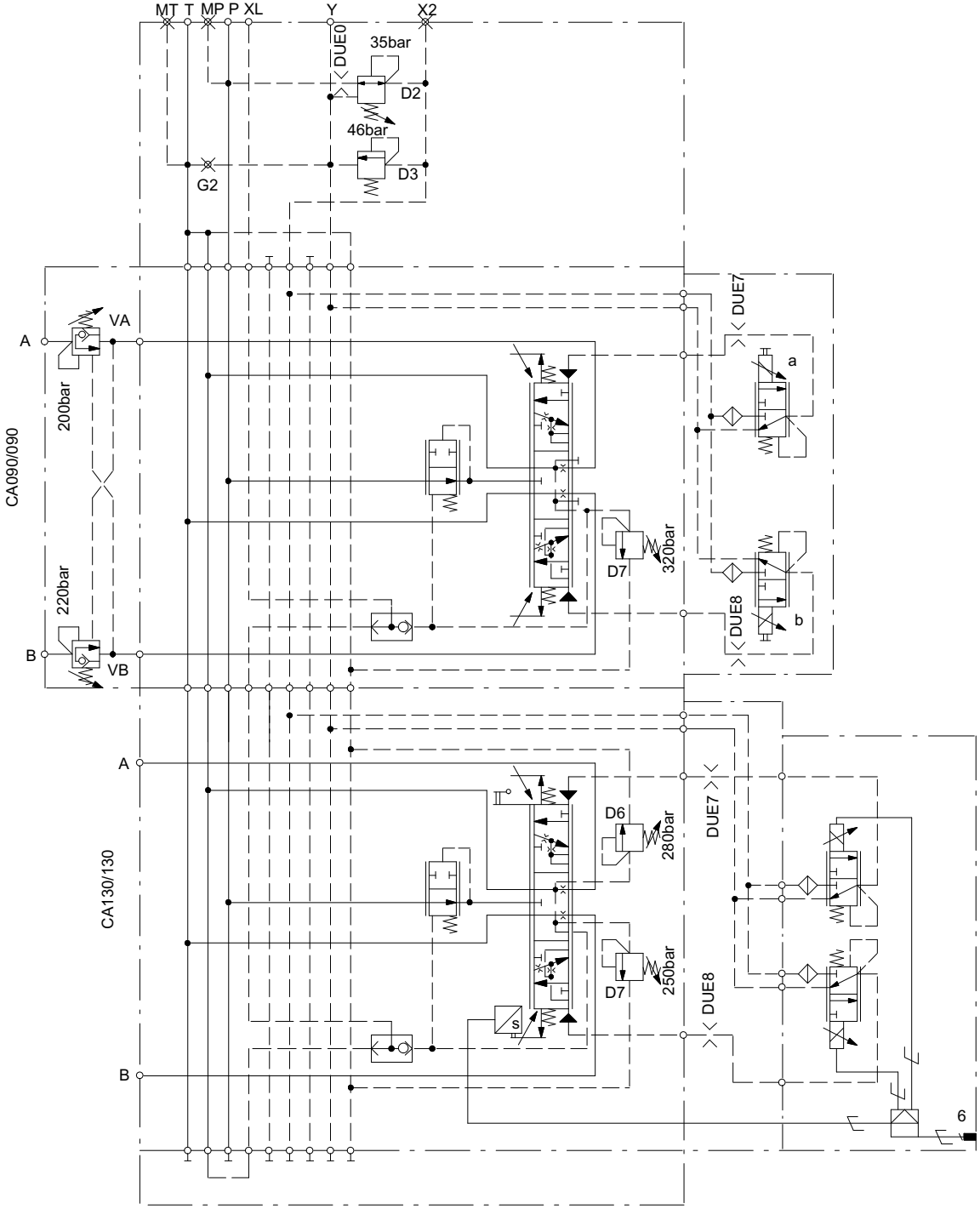
10 Ordering Examples

10.1 Valve system without bolt-on plates



Pos.	Description	Ordering code
	General <ul style="list-style-type: none"> • valve series: SC • nominal size: 12 	
1	Inlet module <ul style="list-style-type: none"> • system pressure relief: 370 bar • connection type: threaded (inch) • without load-sensing pressure relief • pilot oil supply / pilot oil drain: internal • pilot-pressure conditioning 	SC12-MG370-000-001-3546-A-V0T1
2	1st actuator module <ul style="list-style-type: none"> • pressure compensator without load-holding function • actuator section number: 1 • connection type: threaded G3/4", ports A and B: open • primary pressure cut-off: D6 = 250 bar, D7 = 220 bar • spool with 3 operating positions, spool pattern CA • flow rate for actuator A: 90 l/min, actuator B: 60 l/min • pressure compensator spring: N • type of operation: electrohydraulic, proportional pressure reducing valve • supply voltage: 12 V • connection type: AMP Junior Timer, without manual override • without displacement sensor • without hydraulic operation • manual operation, lever position O (straight hand lever) • damping orifice (at both sides) • secondary valves DA: make-up valve, DB: plug screw 	SC12-Y1H3-D250/D220-3CA090/060A00N-E30X-X-HO-N000/S000-A-V0
3	2nd actuator module <ul style="list-style-type: none"> • pressure compensator without load-holding function • actuator section number: 2 • connection type: threaded G3/4", ports A and B: open • primary pressure cut-off: D6 = 350 bar, D7 = 300 bar • spool with 3 operating positions, spool pattern CA • flow rate for actuator A and B: 130 l/min • pressure compensator spring: N • type of operation: electrohydraulic, onboard electronics (OBE) • supply voltage: 24 V • connection type: DT14-6P, without manual override • displacement sensor, without stroke limiter for the main spool • without hydraulic operation • without manual operation • damping orifice (at both sides) • secondary valves DA = 380 bar (adjustable), DB = 340 bar (fixed) 	SC12-Y2H3-D350/D300-3CA130/130A00N-E36B-X-XX-K380/L340-A-V43
4	3rd actuator module <ul style="list-style-type: none"> • pressure compensator without load-holding function • actuator section number: 3 • connection type: threaded G3/4", ports A and B: open • primary pressure cut-off: D6 and D7: plug screws (connection shut off) • electroproportional pressure relief with rising characteristic curve • spool with 3 operating positions, spool pattern AA • flow rate for actuator A and B: 60 l/min • pressure compensator spring: N • without electrohydraulic operation • without displacement sensor • hydraulic operation, vertical port (standard) • without manual operation • damping orifice (at both sides) • without secondary valves 	SC12-Y3H3-S000/S000-3AA060/060A00N-X00X-Y-XX-X000/X000-A-V38
5	End module <ul style="list-style-type: none"> • no control function 	SC12-EX-00-A-V0

10.2 Valve system with bolt-on plates



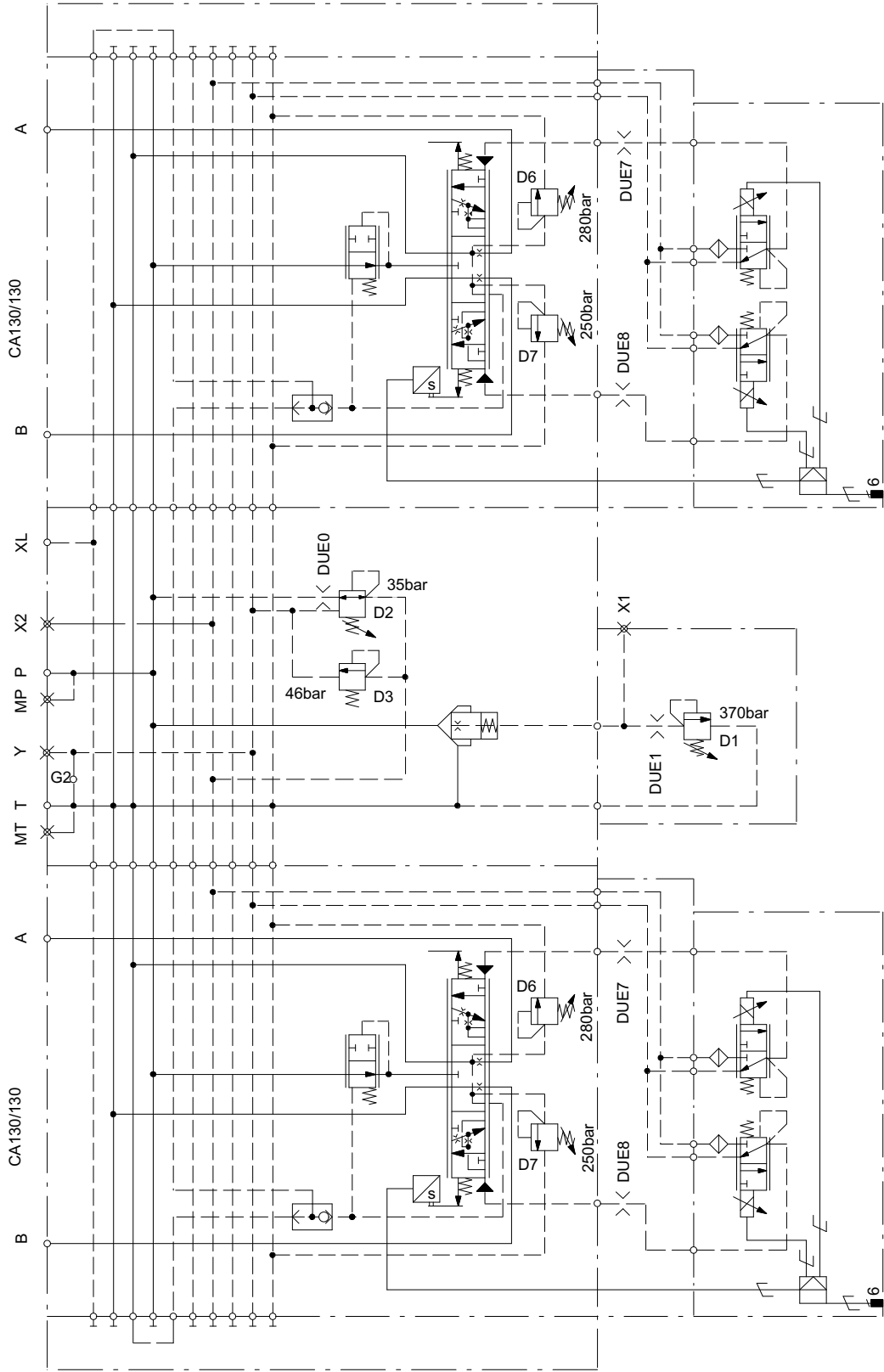
1

2

3

4

Pos.	Unit	Ordering code
	General <ul style="list-style-type: none"> valve series: SC nominal size: 12 	
1	Inlet module <ul style="list-style-type: none"> without system pressure relief connection type: threaded (inch) without load-sensing pressure relief pilot oil supply: internal pilot oil drain: external pilot-pressure conditioning 	SC12-GG000-000-011-3546-A-V0T1
2	1st actuator module with bolt-on plate <ul style="list-style-type: none"> pressure compensator without load-holding function actuator section number: 1 connection type: bolt-on plate, ports A and B: open without primary pressure cut-off D6 primary pressure cut-off: D7 = 320 bar (load sensing A and B) spool with 3 operating positions, spool pattern CA flow rate for actuator A and B: 90 l/min pressure compensator spring: N type of operation: electrohydraulic, proportional pressure reducing valve supply voltage: 24 V connection type: AMP Junior Timer, manual override without displacement sensor without hydraulic operation without manual operation damping orifice (at both sides) without secondary valves Bolt-on plate <ul style="list-style-type: none"> load-control valves at actuator ports A and B load-control valve A = 200 bar, B = 220 bar pilot ratio of the load-control valves = 3:1 ports A and B: G3/4" 	SC12-Y1A4-X000/G320-3CA090/090A00N-E33X-X-XX-X000/X000-A-V0 SC12-PBH-S200-S220-G04-A-V0
3	2nd actuator module <ul style="list-style-type: none"> pressure compensator without load-holding function actuator section number: 2 connection type: threaded G1/2", ports A and B: open primary pressure cut-off: D6 = 280 bar, D7 = 250 bar spool with 3 operating positions, spool pattern CA flow rate for actuator A and B: 130 l/min pressure compensator spring: N type of operation: electrohydraulic, onboard electronics (OBE) supply voltage: 24 V connection type: DT14-6P, without manual override displacement sensor stroke limiter (A-side) and stroke limiter (B-side) are both located on the A-side. without hydraulic operation emergency manual operation (lever length: short), lever position S (cranked hand lever) damping orifice (at both sides) without secondary valves 	SC12-Y2G3-D280/D250-3CA130/130A00N-E36B-X-NS-X000/X000-A-V26
4	End module <ul style="list-style-type: none"> no control function 	SC12-EX-00-A-V0



1

2

3

4

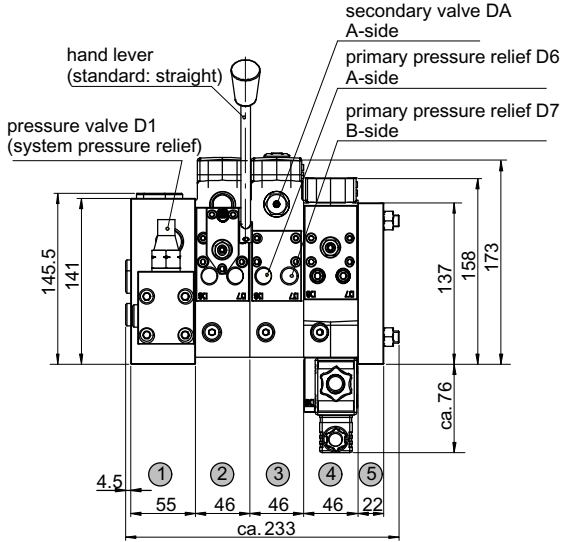
5

Pos	Unit	Ordering code
	General <ul style="list-style-type: none"> valve series: SC nominal size: 12 	
1	End module <ul style="list-style-type: none"> no control function 	SC12-EAX-00-A-V0
2	1st actuator module with bolt-on plate <ul style="list-style-type: none"> pressure compensator without load-holding function actuator section number: 1 connection type: threaded G3/4", ports A and B: open primary pressure cut-off D6= 280 bar, D7 = 250 bar spool with 3 operating positions, spool pattern CA flow rate for actuator A and B: 130 l/min pressure compensator spring: N type of operation: electrohydraulic, On Board electronic (OBE) supply voltage: 24 V connection type: DT14-6P, without manual override displacement sensor, without stroke limiter for the main spool without hydraulic operation without manual operation damping orifice (at both sides) without secondary valves 	SC12-Y1H3-D280/D250-3CA130/130A00N-E36B-X-XX-X000/X000-A-V43
3	Inlet module <ul style="list-style-type: none"> system pressure relief: 370 bar connection type: threaded (inch) without load-sensing pressure relief pilot oil supply: internal pilot oil drain: internal pilot-pressure conditioning 	SC12-MEG370-000-001-3546-A-V0T1
4	2nd actuator module <ul style="list-style-type: none"> pressure compensator without load-holding function actuator section number: 2 connection type: threaded G3/4", ports A and B: open primary pressure cut-off: D6 = 280 bar, D7 = 250 bar spool with 3 operating positions, spool pattern CA flow rate for actuator A and B: 130 l/min pressure compensator spring: N type of operation: electrohydraulic, onboard electronics (OBE) supply voltage: 24 V connection type: DT14-6P, without manual override displacement sensor, without stroke limiter for the main spool without hydraulic operation without manual operation damping orifice (at both sides) without secondary valves 	SC12-Y2H3-D280/D250-3CA130/130A00N-E36B-X-XX-X000/X000-A-V43
5	End module <ul style="list-style-type: none"> no control function 	SC12-EX-00-A-V0

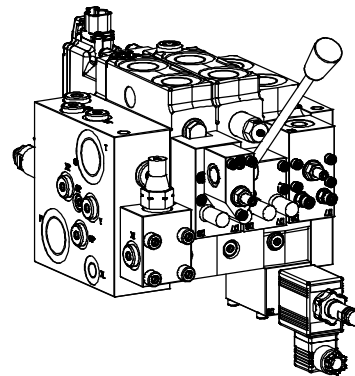
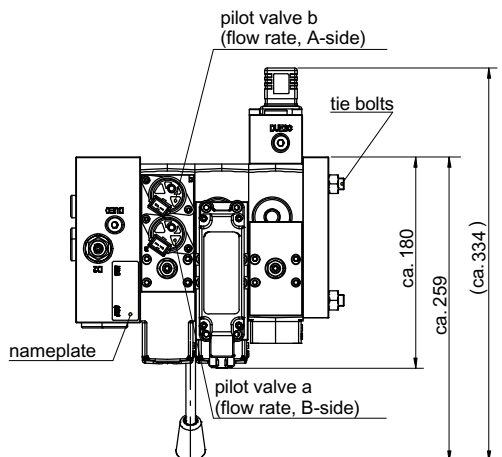
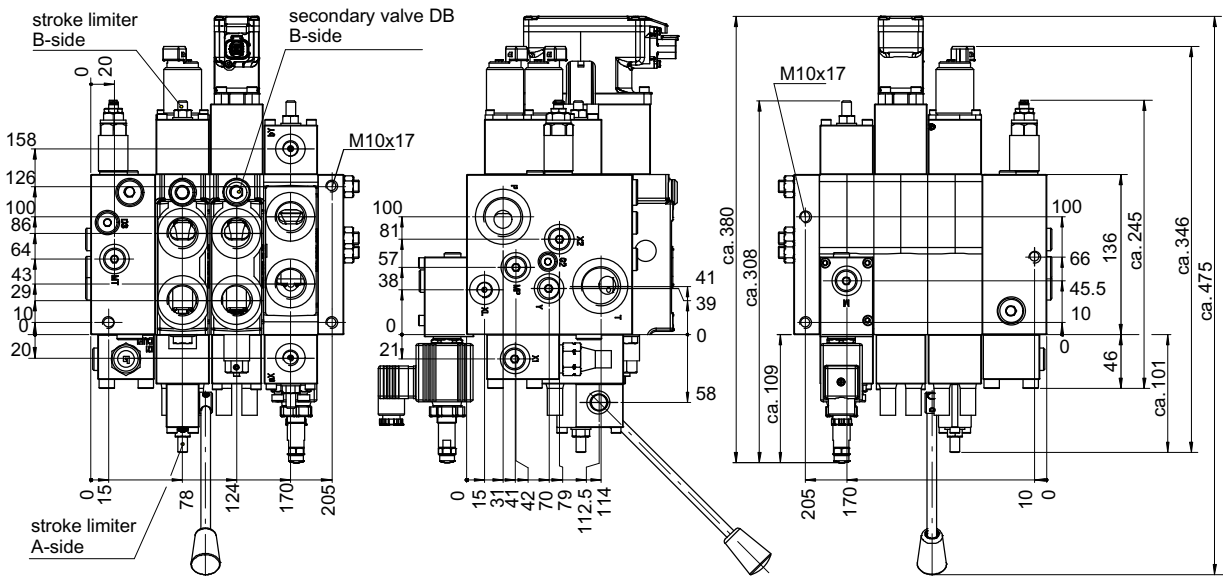
11 Dimensions

11.1 Valve system without bolt-on plates

As per ordering example, section 9.1.

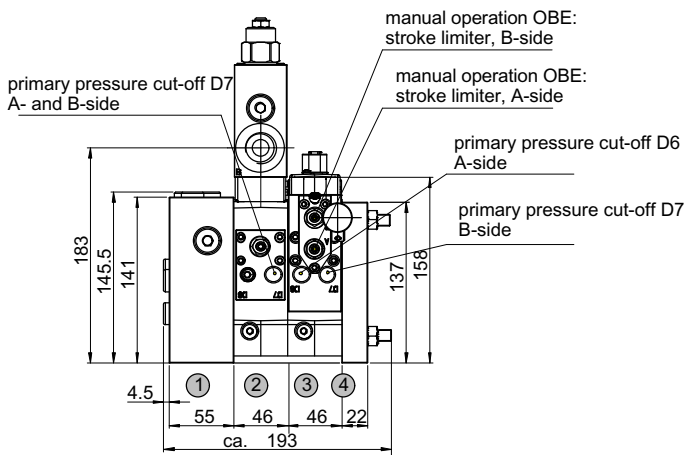


Item	Module
1	Inlet module M
2	1st actuator module Y
3	2nd actuator module Y
4	3rd actuator module Y
5	End module

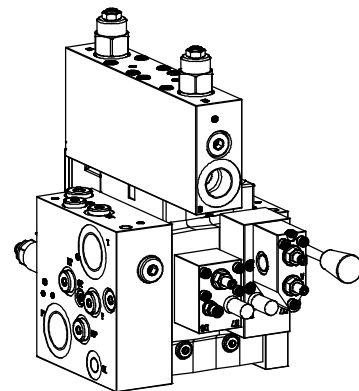
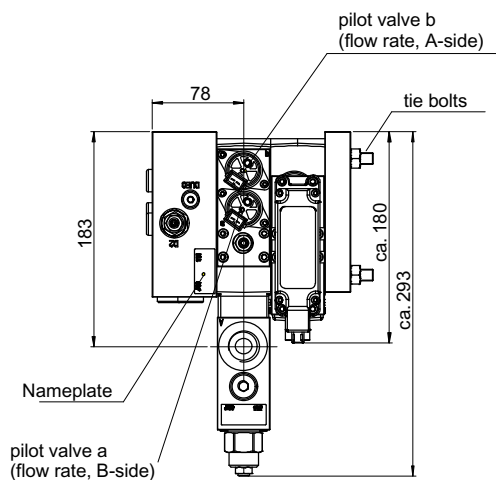
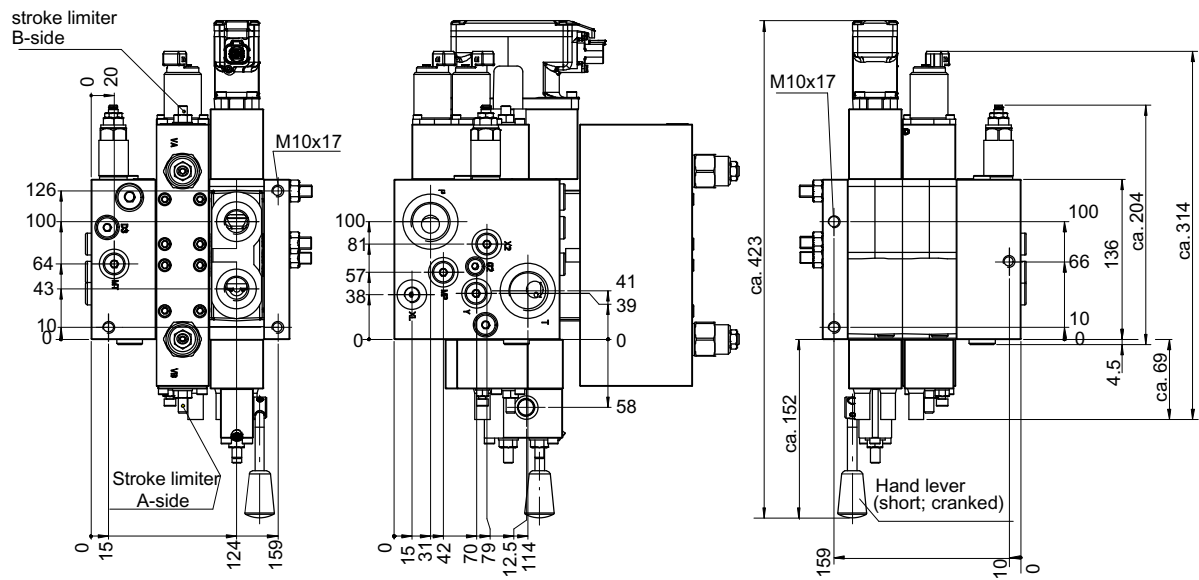


11.2 Valve system with bolt-on plates

As per ordering example, section 9.2.

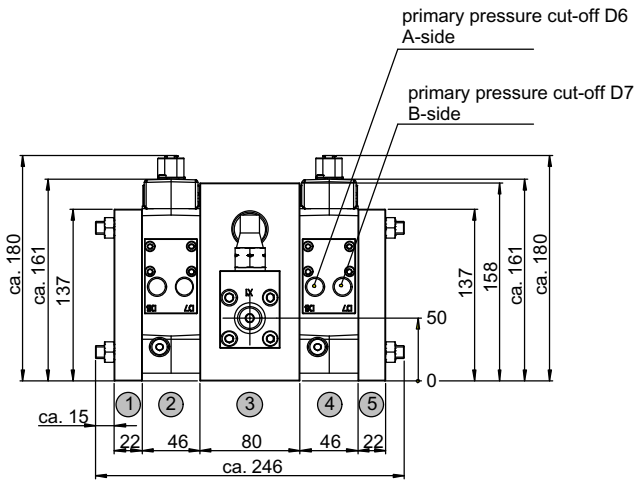


Item	Module
1	Inlet module G
2	1st actuator module Y
3	2nd actuator module Y
4	End module

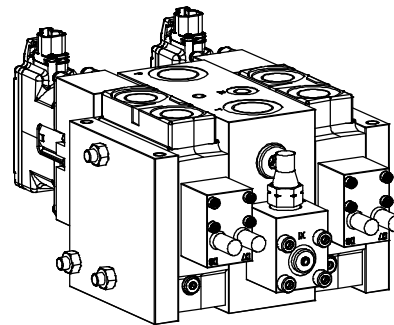
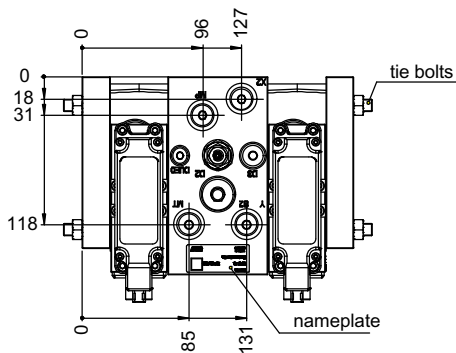
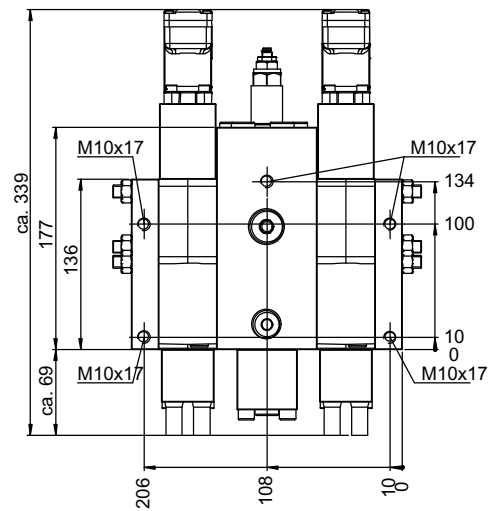
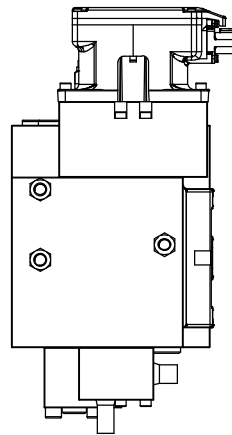
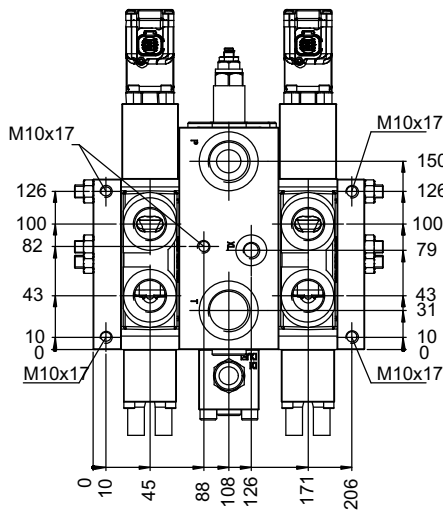


11.3 Valve system with central inlet module

As per ordering example, section 9.3.



Item	Module
1	End module
2	1st actuator module Y
3	Inlet module M
4	2nd actuator module Y
5	End module



12 Note

This catalogue is intended for users with specialist knowledge. The user must check the suitability of the equipment described herein in order to ensure that all of the conditions necessary for the safety and proper functioning of the system are fulfilled. If you have any doubts or questions concerning the use of these valves, please contact Bucher Hydraulics.

13 Related data sheets

Description	Data sheet
Electrohydraulic actuator	100-P-000230
Inverse Proportional Pressure Relief Cartridge, Size 2...4 (Series DBDTC-1LG...)	400-P-585211
Proportional valves sectional design Series SC22	301-P-9050084
Proportional valves sectional design Series SVC25	301-P-9050085
Proportional Pressure Relief Cartridge, Size 2 ... 4 (Series DBDTC-1L...)	400-P-585111
Proportional directional valve Series L.8S	100-P-000047
Proportional directional valve system SC12 EX for potentially explosive areas	301-P-9050092
Proportional directional valve system in sectional design Series SC18	301-P-9050089
2/2 Directional seat valves size 3 (Series WSP22GNA3.../WSP22ONA3...)	400-P-120801
3/2 Cartridge spool valves size 3 (Series WKP32GNA3.../WKP32ONA3...)	400-P-120821

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Classification: 450