



Remote controls with flexible cables

TECHNICAL CATALOG



Additional information

This catalogue shows the product in the most standard configurations.
Please contact our Sales Dpt. for more detailed information or special requests.

WARNING!

All specifications of this catalogue refer to the standard product at this date.
Walvoil, oriented to a continuous improvement, reserves the right to
discontinue, modify or revise the specifications, without notice.

**WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN
INCORRECT USE OF THE PRODUCT.**

4th edition November 2017

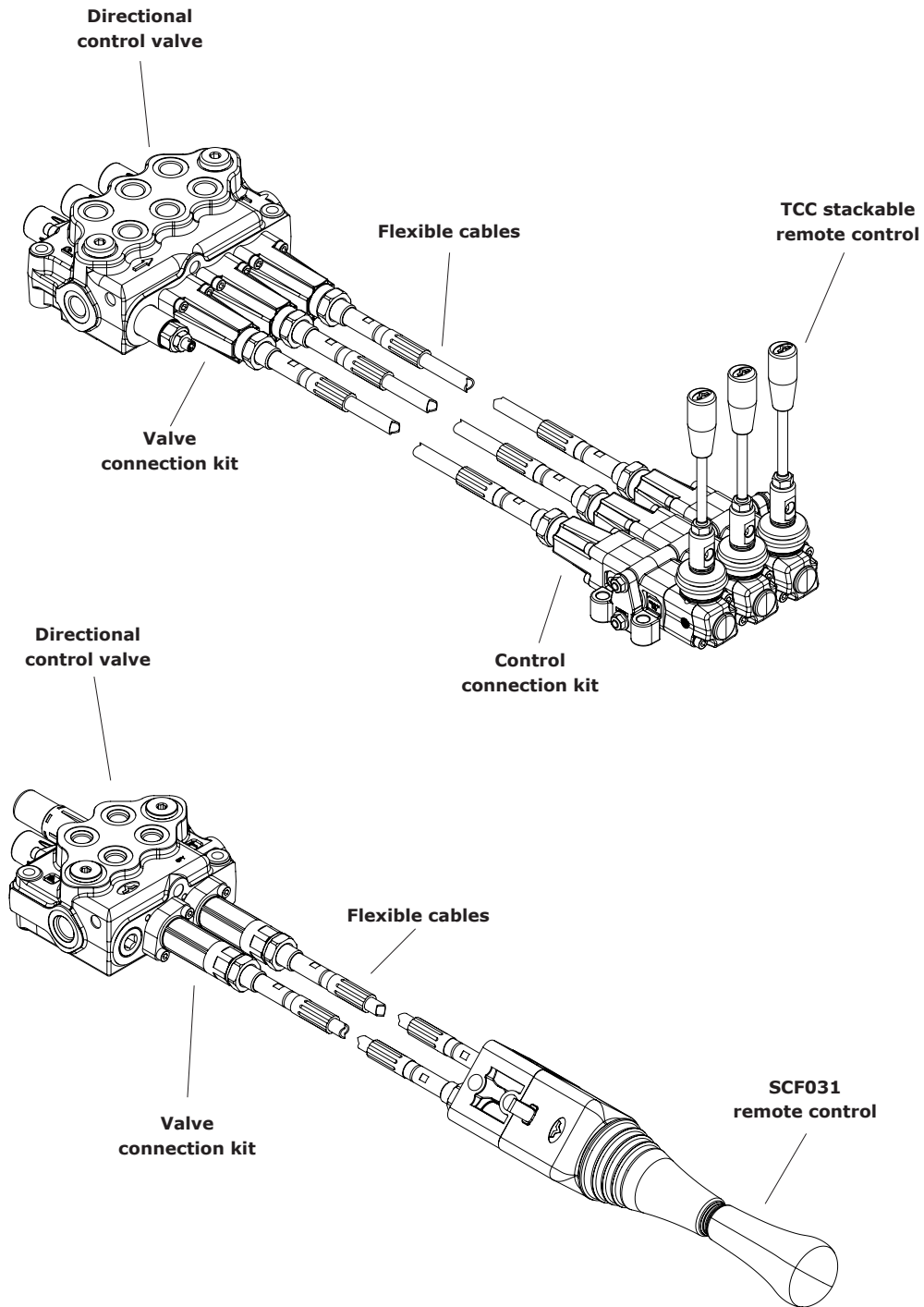
System description	page 3
TCC series	page 5
SCF031/SCF034/SCF032 series	page 11
Flexible cables	page 19

Remote controls

System description

These are remote controls with flexible cables.

They allow to install the directional control valve close to the hydraulic circuit components and to install the remote control in an ergonomic position.





TCC series

Remote controls with flexible cables

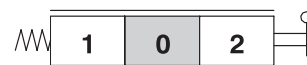
- Up to 10 sections
- Low actioning efforts
- Detents, safety lever, several types of knob available
- TCC5 recommended for SD4, SD5, SD6, SDM080 and DF5 valves;
TCC10 recommended for other valves

Working conditions

Max. load: in traction	1450 N - 340 lbf
in compression	880 N - 200 lbf
Minimum recommended bend radius	R = 150 mm - 5.9 in
Working temperature	from -40 to 80 °C - from -40°F to 176°F
Maximum recommended length	4000 mm - 157.48 in

NOTE: the features are referred to remote controls with flexible cables

Dimensions

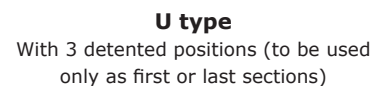


T type

Without spring return for detented controls on directional valve and control without neutral position

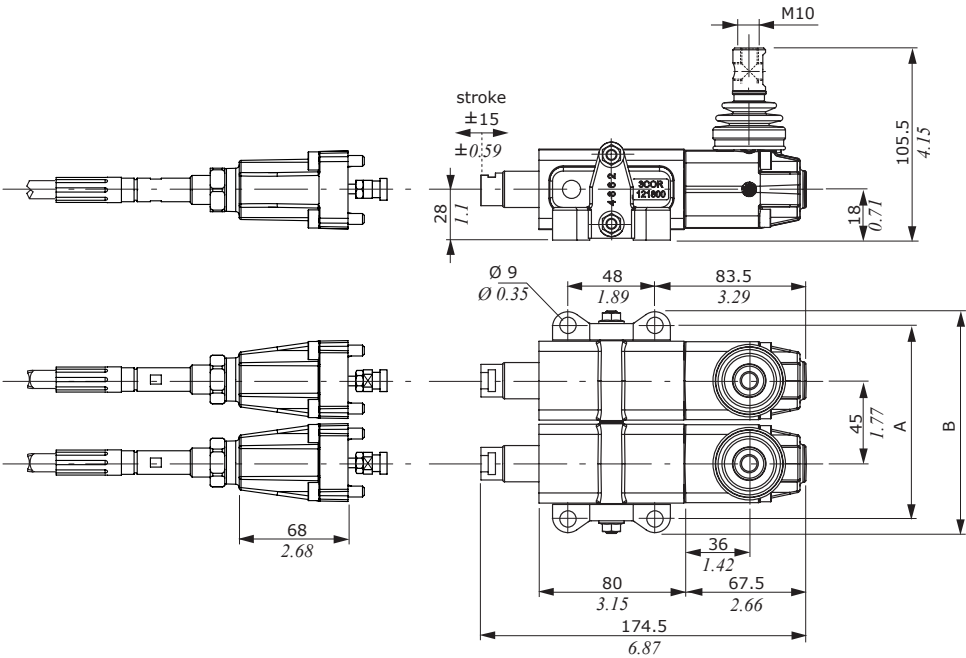


U type with movement selector



Type	TCC5/1		TCC5/2		TCC5/3		TCC5/4		TCC5/5		TCC5/6		TCC5/7	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
A	56	2.20	96	3.78	136	5.35	176	6.93	216	8.50	256	10.08	296	11.65
B	73	2.87	113	4.45	153	6.02	193	7.6	233	9.17	273	10.74	313	12.32

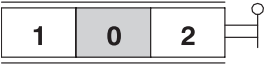
Dimensions



M type
Spring return in neutral position



T type
Without spring return for detented controls on directional valve and control without neutral position

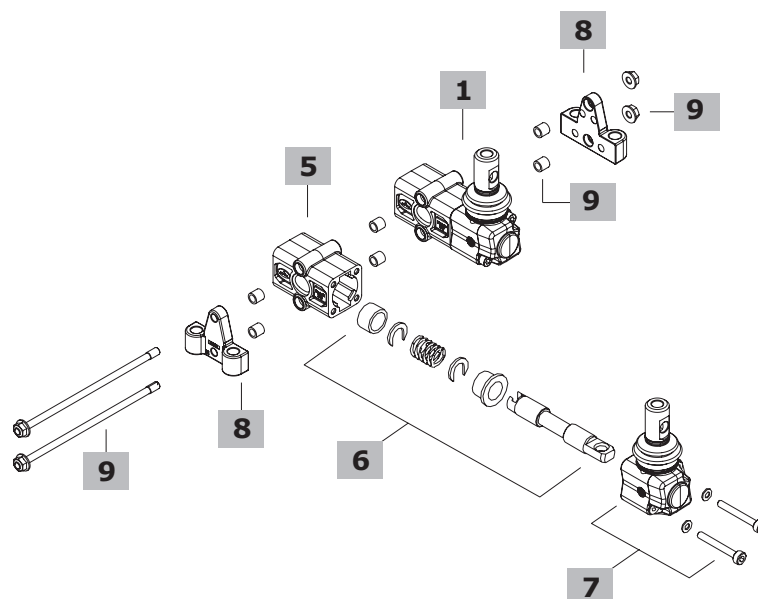
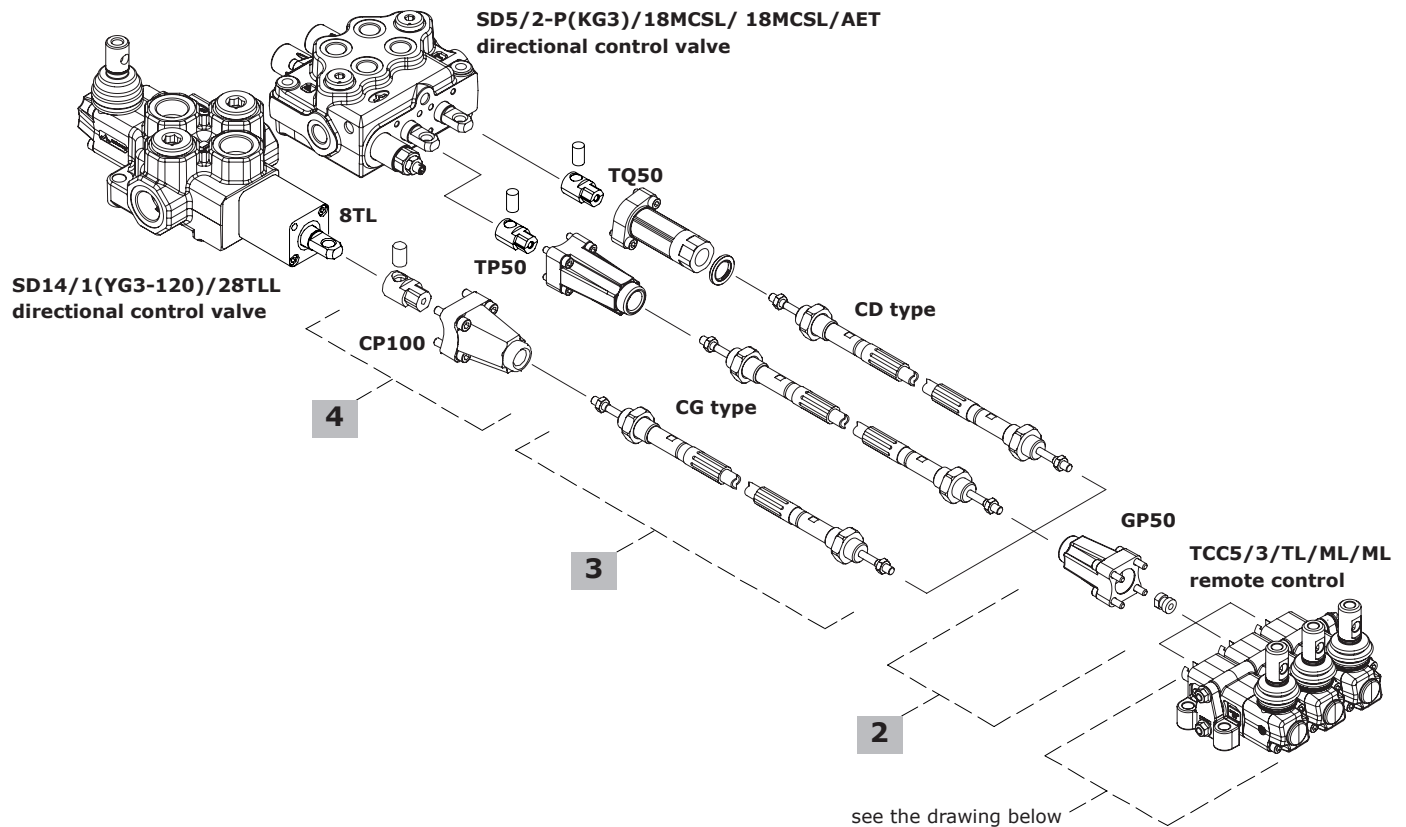


TYPE	TCC10/1		TCC10/2		TCC10/3		TCC10/4		TCC10/5		TCC10/6	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
A	61	2.4	106	4.17	151	5.94	196	7.72	241	9.49	286	11.26
B	78	3.07	123	4.84	168	6.61	213	8.39	258	10.16	303	11.93

Connecting example

Description example

1 1 1 2 3 3 4 4 4
TCC5/3/ TL / ML / ML + GP50X3 + CG2000X2 + CD2000 + CP100 + TP50 + TQ50 + SD14/1(YG3-120)/28TLL + SD5/2-P(KG3-120)/18MCSL/18MCSL/AET



1 Complete section

TYPE	CODE	DESCRIPTION
<u>TCC 5 remote control</u>		
ML	6TEL005100	Complete section with M10 standard lever and spring return
TL	6TEL005200	Complete section with M10 standard lever without spring return
UL	6TEL005211	Complete section with M10 standard lever and movement selector without spring return
<u>TCC 10 remote control</u>		
ML	6TEL010100	Complete section with M10 standard lever and spring return
TL	6TEL010200	Complete section with M10 standard lever without spring return

2 Control connection kit

TYPE	CODE	DESCRIPTION
GP50	5TEL005005	Type for TCC5
GPWP50	5TEL005006	Type for TCC5 waterproof
GP100	5TEL010005	Type for TCC10
GPWP100	5TEL010010	Type for TCC10 waterproof

3 Flexible cables

TYPE	CODE	DESCRIPTION
<u>CD type with one fixing end and one turning end</u>		
CD1000	4CAV601000	Length 1000 mm - 39.37 in
CD1250	4CAV601250	Length 1250 mm - 49.20 in
For different cables see page 18		
<u>CG Type with both turning ends</u>		
CG1000	4CAV701000	Length 1000 mm - 39.37 in
CG1250	4CAV701250	Length 1250 mm - 49.20 in
For different cables see page 18		

4 Valve connection kit

See page 18

5 Body

TYPE	CODE	DESCRIPTION
<u>TCC 5 remote control</u>		
LCB	5COR111010	LCB mechanical joystick
T-M	3COR111000	For complete section with and without spring return
U	3COR111002	As previous with movement selector
<u>TCC 10 remote control</u>		
T-M	3COR121800	For complete section with and without spring

6 Positioning controls

TYPE	CODE	DESCRIPTION
<u>TCC 5 remote control</u>		
M	5GIU316990	Kit with spring return
T	5GIU316992	Kit without spring return
U/ULEB	5GIU316993	Kit for movement selector
<u>TCC 10 remote control</u>		
M	5GIU320990	Kit with spring return
T	5GIU320991	Kit without spring return

7 Actioning controls

TYPE	CODE	DESCRIPTION
<u>TCC 5 remote control</u>		
L	5LEV205010	M10 standard lever
L/RC5	5LEV105010	M8 lever
LF1	5LEV205012	M10 lever with stroke adjustment
LSG	5LEV205025	M10 waterproof lever
LEB	5LEV605050	M8 safety lever with lock in neutral
SLP	5COP105010	without lever with dust cover plate
LCB	5CLO205105	Joystick for 2 sections
<u>TCC 10 remote control</u>		
L	5LEV110015	M10 standard lever
SLP	5COP110010	without lever with dust cover plate
LCB11	5CLO211100	Joystick for 2 sections
LSG	5LEV110015S	M10 waterproof lever

8 Fixing brackets

CODE	DESCRIPTION
<u>TCC 5 remote control</u>	
5STA346057	Standard support
5STA346058	Selector support
<u>TCC 10 remote control</u>	
5STA354065	Standard support

9 Tie rod kits

CODE	DESCRIPTION
<u>TCC 5 remote control</u>	
5TIR106073	TCC5/1 tie rod kit
5TIR106113	TCC5/2 tie rod kit
5TIR106153	TCC5/3 tie rod kit
5TIR106193	TCC5/4 tie rod kit
5TIR106233	TCC5/5 tie rod kit
5TIR106273	TCC5/6 tie rod kit
5TIR106313	TCC5/7 tie rod kit
5TIR106353	TCC5/8 tie rod kit
5TIR106393	TCC5/9 tie rod kit
5TIR106433	TCC5/10 tie rod kit
<u>TCC 10 remote control</u>	
5TIR106078	TCC10/1 tie rod kit
5TIR106123	TCC10/2 tie rod kit
5TIR106168	TCC10/3 tie rod kit
5TIR106213	TCC10/4 tie rod kit
5TIR106258	TCC10/5 tie rod kit
5TIR106303	TCC10/6 tie rod kit
5TIR106348	TCC10/7 tie rod kit
5TIR106394	TCC10/8 tie rod kit
5TIR106438	TCC10/9 tie rod kit
5TIR106483	TCC10/10 tie rod kit



SCF031 series Flexible cable remote control joystick

- Mechanical safety lock
- Ergonomic handles with push-buttons available
- Single or dual spool operation for a 2 section directional valve
- High efficiency
- Body, rubber boot and knob made in self-extinguishing and recyclable plastic polymer

Working conditions

Max. load: in traction	1400 N - 315 lbf
in compression	900 N - 202 lbf
Minimum recommended bend radius	R = 150 mm - 5.9 in
Working temperature	from -20 to 80 °C - from -4°F to 176°F
Max. recommended length	4000 mm - 157.48 in
Average efficiency	70%

NOTE: the features are referred to remote control with flexible cables

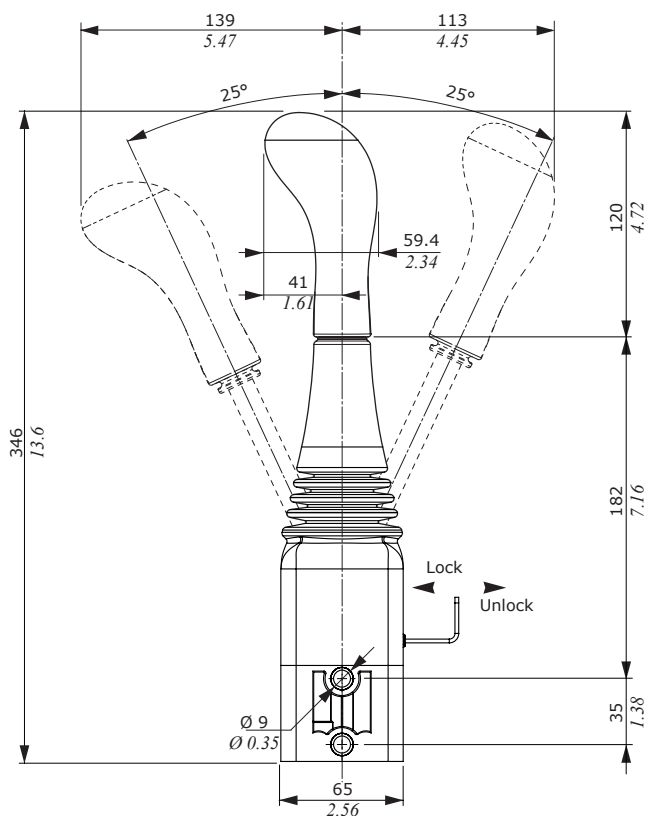
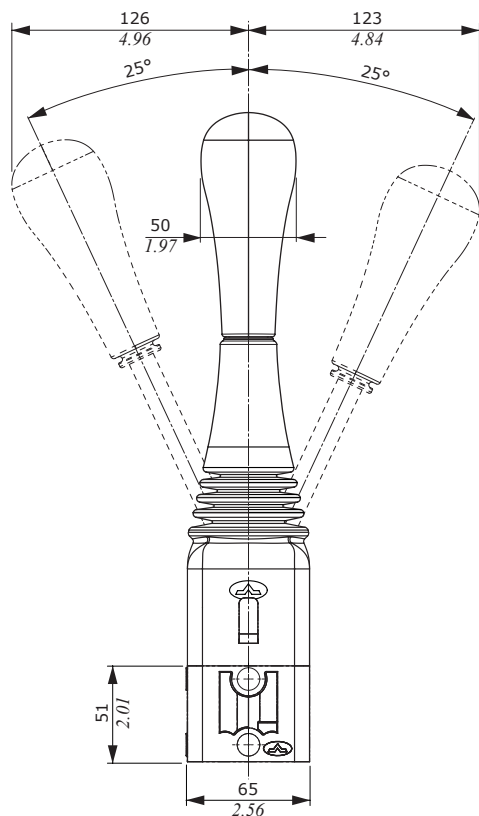
Features

Push-buttons

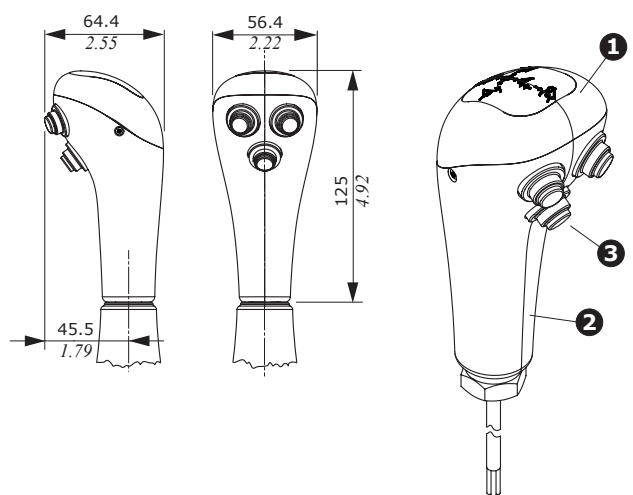
Current/voltage	6 A / 125 VAC 3 A / 250 VAC 3 A / 30 VDC
Mechanical life	10 ⁵ n° of operation
Electric life	25x10 ³ n° of operation
Operating force	9.3 N - 2.09 lbf
Weather protection	IP 64

Dimensions and handles

With FW type handle

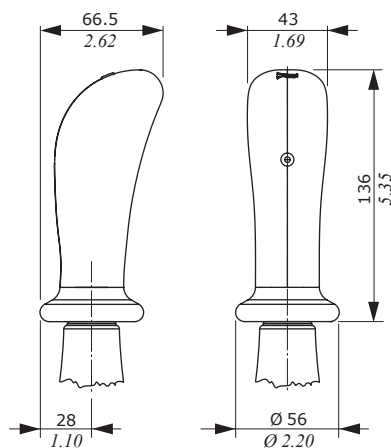


With FWV Series handle

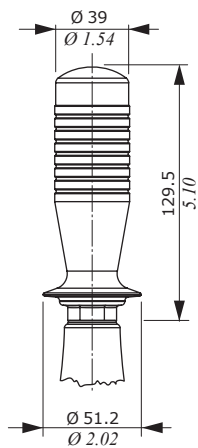


- 1) Upper half-shell
- 2) Bottom half-shell
- 3) K type push-button

With V Series handle



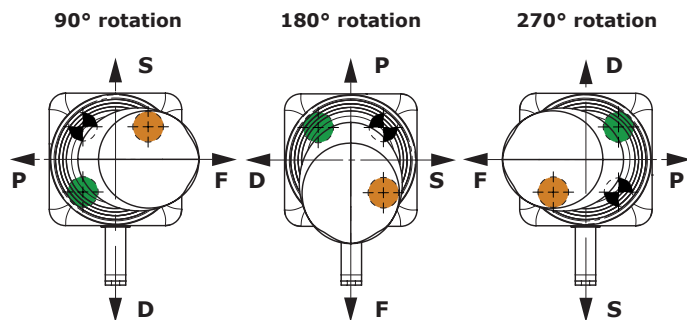
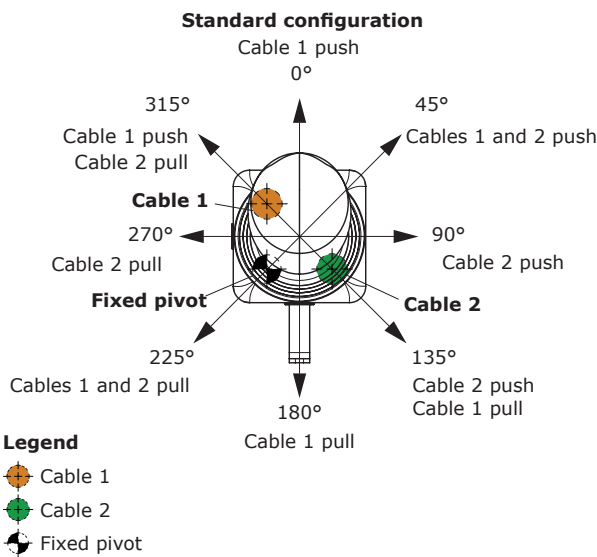
With 10 Series handle



Operations and options

Operation and handle position

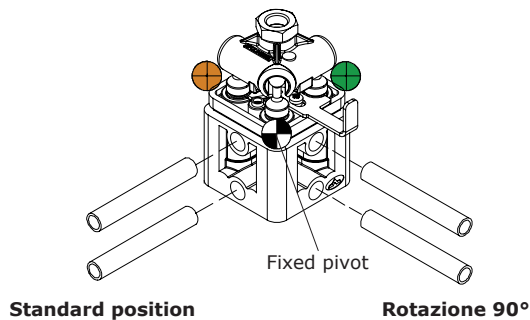
Handle can be mounted with 90° rotation step; the table below shows cables operation with handle in non-standard positions.



Handle operation direction	90°	180°	270°
F Front	cable 2 push	cable 1 pull	cable 2 pull
P Rear	cable 2 pull	cable 1 push	cable 2 push
D Right	cable 1 pull	cable 2 pull	cable 1 push
S Left	cable 1 push	cable 2 push	cable 1 pull

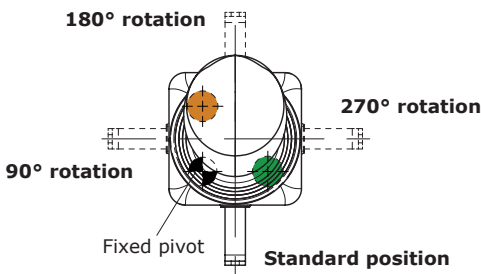
Body mounting

The position of the assembly bushing can be rotated 90° in order to allow the selection of the pilot valve fixing side.



Lock position

The mechanical lock can be mounted with 90° rotation step; its position refers to pivot's and cables' one.



Description example and ordering codes

Description example

SCF031 / 0 2 FWV-B-1KN5055-2KN5055-3KN5055+CD1500x2+SDM122/2-P(UD-180)/1[S]13SL/1[S]8MASL/AET

1 2

3

4

Working section parts ordering codes

SCF031/02 FWV-B-1KN5055-2KN5055-3KN5055 + CD1500x2 + TQ81x2 + SDM122/2-P(UD-180)/1[S]13SL/1[S]8MASL/AET

1

4

5

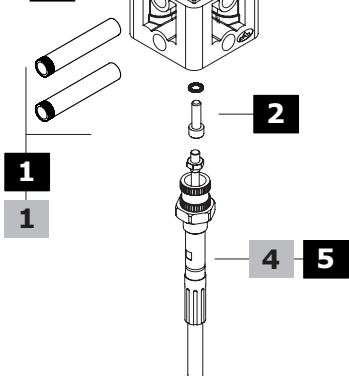
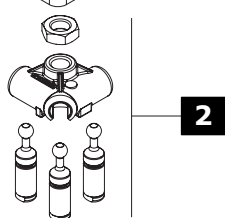
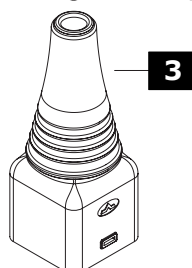
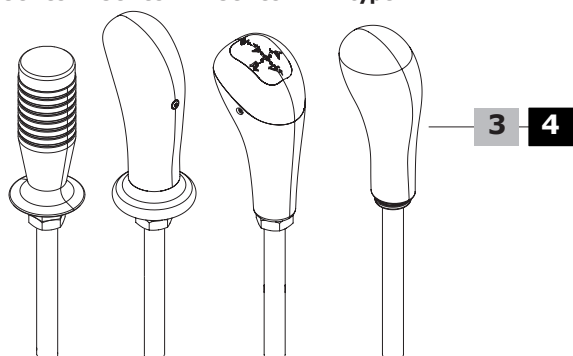
6

10
Series

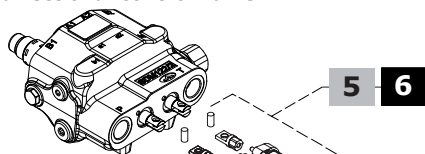
V
Series

FWV
Series

FW
type



SDM122/2
directional control valve



4 5

SCF031/02 FWV
remote control

see exploded view

Description composition

1 Body mounting

TYPE	DESCRIPTION
0	Mounting bushings in standard position
1	Mounting bushings with 90° rotation position

2 Mechanical lock

TYPE	DESCRIPTION
2	In standard position
4	90° rotation position
6	180° rotation position
8	270° rotation position

Note: for operation see page 13

3 Handles

For description see #4 of "Ordering codes".

4 Flexible cable

TYPE	DESCRIPTION
CD1500	CD cable with length 1500 mm - 59 in

For other lengths see page 20

5 Connection kit

TYPE	DESCRIPTION
TQ81	Connection kit for SDM122

Note: for other connection kits see page 21

Ordering codes

1

TYPE	CODE	DESCRIPTION
SCF031/02(STD)	5COR211761	Standard position
SCF031/04(90)	5COR211762	90° rotation position
SCF031/06(180)	5COR211763	180° rotation position
SCF031/08(270)	5COR211764	270° rotation position

Note: for operation and handle position see page 13.

2 Control kit

TYPE	CODE	DESCRIPTION
-	5CIN305	Standard control kit

3 Bellow

TYPE	CODE	DESCRIPTION
SCF031	3SOF204175	Bellows

5 Flexible cable

See page 18

6 Connection kit

TYPE	DESCRIPTION
TQ81	Connection kit for SDM122 and DLM122

Note: for other connection kits see page 21

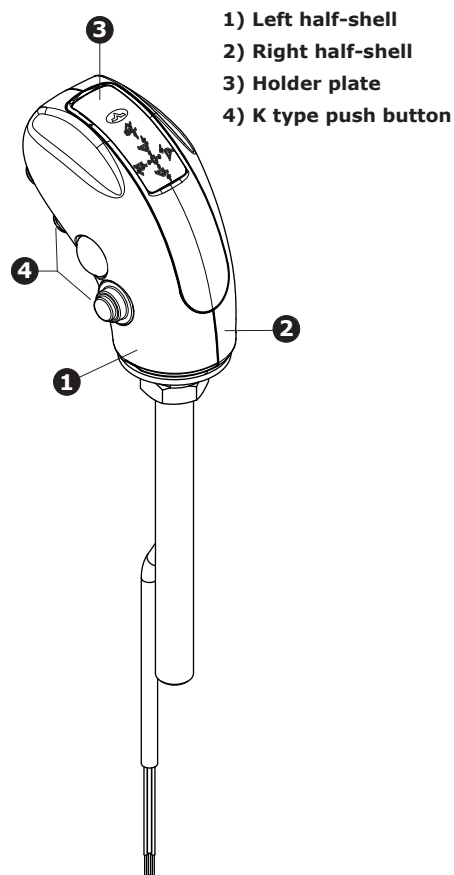
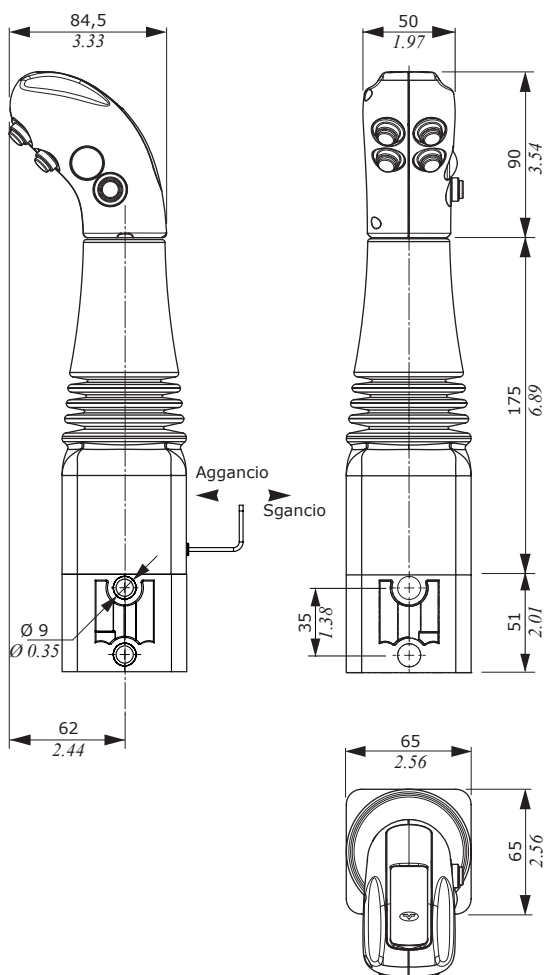
4 Complete handles (with rod)

TYPE	CODE	DESCRIPTION
FW	XAST481400	Standard without push-button
Series FWV handle		
FWV-B	XAST482304	Without push-button, with symbols according to UNI EN 12525
FWV-B-1KN5055-2KN5055-3KN5055		
	XAST482300	With 3 push-buttons and symbols according to UNI EN 12525
Series V handle		
V004	XAST281425	Without switches
V054-045	XAST281422	3 position spring return rocker switch
V104-045	XAST281416	Push-button with horn symbol
V204-045	XAST281426	Push-button without horn symbol
Series 10 handle		
X	XAST481414	Push button with spring return
Z	XAST481415	Push-button with detent
Y	XAST481421	3 position spring return rocker switch

Note: for further configuration contact Sales Department

Dimensions and handles

Configuration with multi-micro ergonomic AMH type handle and dedicated bellow.



Description example and ordering codes

Description example

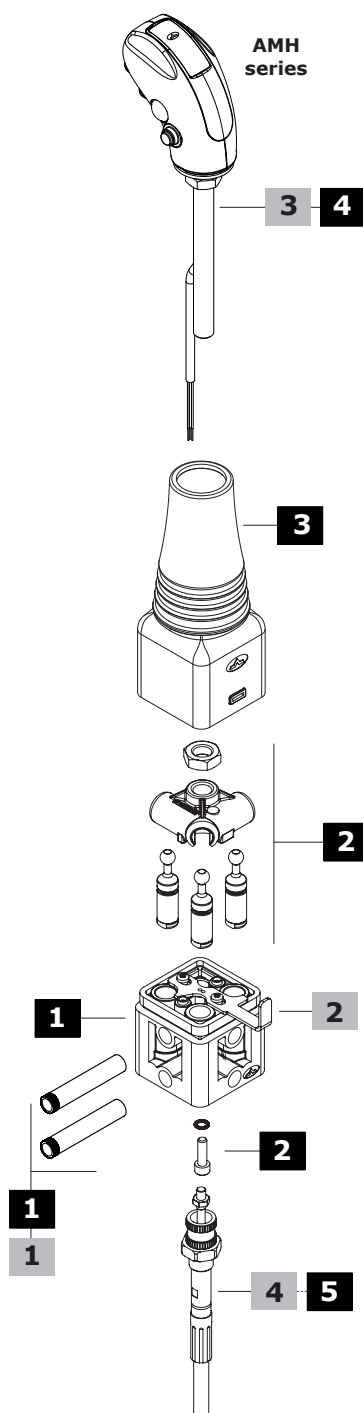
SCF034 / 0 2 AMHK0500A4-4(TAP)-5N5055-6N5055-7N5055-8N5055-9N5055-(E1) + CD1500x2

1
2
3
4

Working section parts ordering codes

SCF034/02 AMHK0500A4-4(TAP)-5N5055-6N5055-7N5055-8N5055-9N5055-(E1) + CD1500x2

1
4
5



Description composition

1 Body mounting

See page 15

2 Mechanical lock

See page 15

3 Handles

For description see #4 of "Ordering codes".

4 Flexible cable

TYPE DESCRIPTION
CD1500 CD cable with length 1500 mm - 59 in
 Note: for cables and connection kit see pages 20 and 21

Ordering codes

1 Body kit

See page 15

2 Control kit

See page 15

3 Bellow

TYPE	CODE	DESCRIPTION
SCF034	3SOF204176	Bellows

4 Handles

Available AMH handles with custom length. Example:

AMH series handle

TYPE: **AMHK0500A4-4(TAP)-5N5055-6N5055-7N5055-8N5055-9N5055-(E1)**

CODE: 2IM3000008 DESCRIPTION: With 4 front push-button and 1 side push-button

TYPE: **AMHM0300C4-1RB1150-6VB1150-8VB1150-(E3)**

CODE: 2IM3000018 DESCRIPTION: With 2 front push-button and 1 side push-button and symbols according to UNI EN 12525.

Note: for further configuration contact Sales Department

5 Flexible cable

For cables and connection kit see pages 20 and 21.

Description example and ordering codes

SCF032 is the remote control for special configuration, for example particular length or formed rod and handles not included. Please contact our Sales Department for further information.

Description example with FW handle

SCF032 / 0 2 FW + CD1500x2

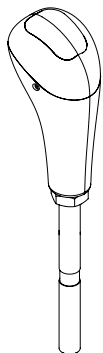


Working section parts ordering codes

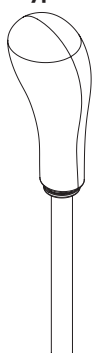
SCF032/02 FW + CD1500x2



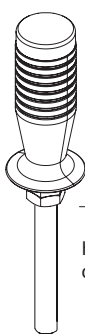
FWV Series



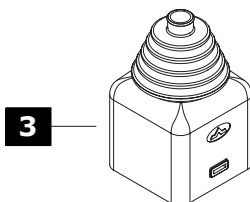
FW type



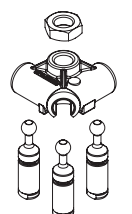
10 Series



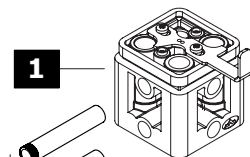
Handle with customized rod length



3

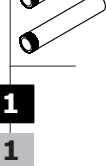


2



1

2



1

1



2

4

5

Description composition

1 Body mounting

See page 15

2 Mechanical lock

See page 15

3 Handles

For description see #4 of "Ordering codes".

4 Flexible cable

TYPE	DESCRIPTION
CD1500	CD cable with length 1500 mm - 59 in

Note: for cables and connection kit see pages 20 and 21.

Ordering codes

1 Body kit

See page 15

2 Control kit

See page 15

3 Bellows

TYPE	CODE	DESCRIPTION
SCF032	3SOF204111	Short bellows

4 Handles

Available handles with custom length. Example:

TYPE	CODE	DESCRIPTION
S	-	Without handle, without handle lever

Standard handle

FW	XAST481400	Standard without push-button, H 260 mm - 10.24 in
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FWV-B	XAST482301	Standard up to 3 push-buttons and symbols according to UNI EN 12525, H 265.6 mm - 10.46 in
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10 series handle

X	XAST281414	Push button with spring return, H 252 mm - 9.92 in
Z	XAST281415	Push-button with detent, H 254 mm - 10 in
Y	XAST281421	3 positions spring return rocker switch, H 252 mm - 9.92 in

Note: for further configuration contact Sales Department

5 Flexible cable

For cables and connection kit see pages 20 and 21.

Flexible cables



- High resistance and low actioning efforts
- Weatherproof resistance

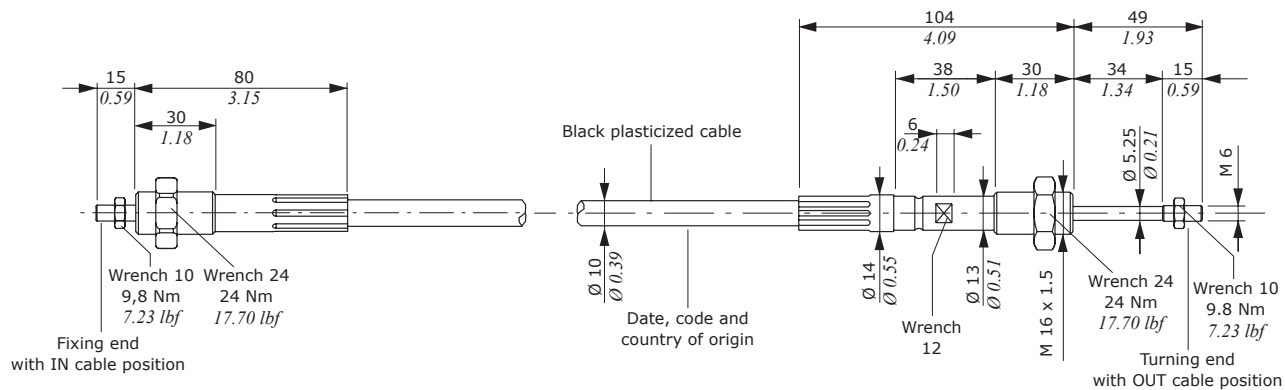
Working conditions

Max. load: in traction	1450 N - 340 lbf
in compression	880 N - 198 lbf
Minimum recommended bend radius	R = 150 mm - 5.9 in
Working temperature	from -40 to 80 °C - from -40°F to 176°F
Maximum recommended length	5000 mm - 157.48 in

Dimensions

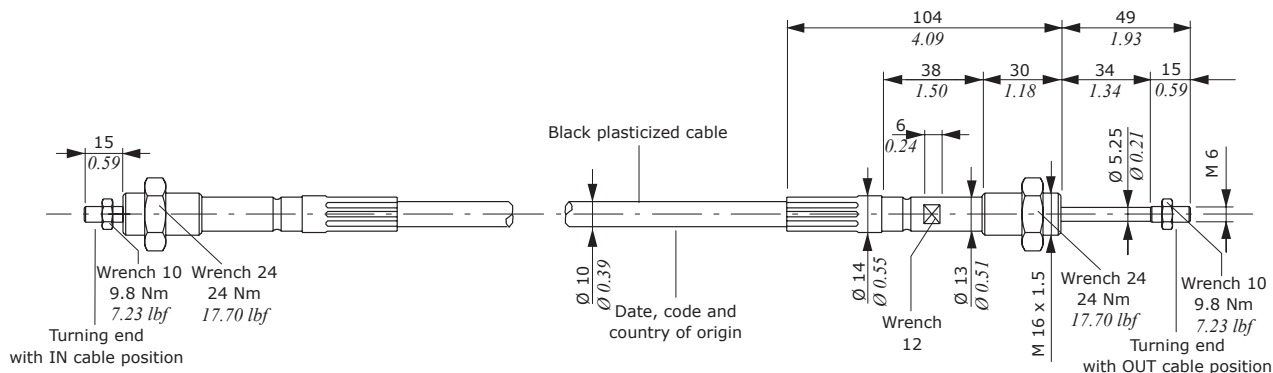
CD cable

Flexible polyurethane cable with 5 wires: $0.75 \text{ mm}^2 - 0.0012 \text{ in}^2$ ($\varnothing$ external 5.2 mm - 0.20 in, $\varnothing$ wire 1.55 mm - 0.06 in) with one fixing end and one turning end.



CG cable

Flexible polyurethane cable with 5 wires: $0.75 \text{ mm}^2 - 0.0012 \text{ in}^2$ ($\varnothing$ external 5.2 mm - 0.20 in, $\varnothing$ wire 1.55 mm - 0.06 in) with both turning ends.



Ordering codes for flexible cables

Connecting scheme

Flexible cables and connecting kit at both ends are used to join TCC or SCF control group to the directional valve.

On the TCC series remote control there is always a GP kit; on the valve, the kit choice depends on the cable. The TP kit is used with CG cable with turning ends. The CP kit must be used instead of TP one when TL control is mounted on the valve, with the lever on the opposite side.

On the SCF031/32 remote control the TQ kit is assembled on the spool end side and it allows the connection of the cable to the directional valve. It's waterproof and it permits freedom of movement to fixed end cables.

TCC5/1/ML + GP50 + CG1000 + TP50

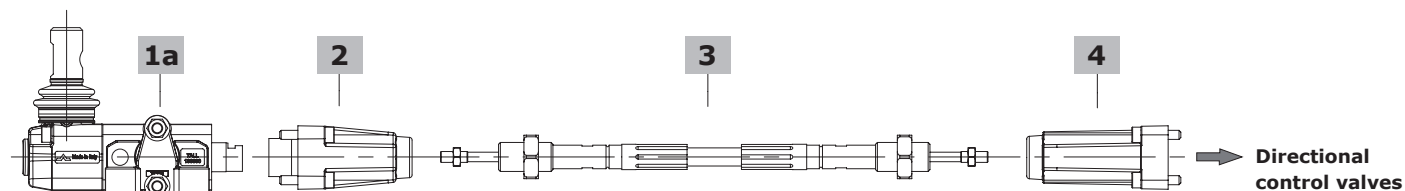
1a

2

3

4

TCC5/1/ML + GP50 + CD1000 + TQ50



SCF031/02FW + CD1500 x2 + TQ70

1b

1b

3

4

Directional control valves

Ordering codes for flexible cables and connection kit

1a TCC remote control page 5-9

1b SCF031 remote control page 11-16

2 Control connection kit

TYPE	CODE	DESCRIPTION
GP50	5TEL005005	Kit for TCC5
GP100	5TEL010005	Kit for TCC10

3 Flexible cables

TYPE	CODE	DESCRIPTION
CD type: with one fixing end and one turning end		
CD1000	4CAV601000	Length 1000 mm - 39.37 in
CD1250	4CAV601250	Length 1250 mm - 49.21 in
CD1500	4CAV601500	Length 1500 mm - 59.05 in
CD1750	4CAV601750	Length 1750 mm - 68.90 in
CD2000	4CAV602000	Length 2000 mm - 78.74 in
CD2500	4CAV602500	Length 2500 mm - 98.42 in
CD3000	4CAV603000	Length 3000 mm - 118.11 in
CD3500	4CAV603500	Length 3500 mm - 137.79 in

3 Flexible cables (continue)

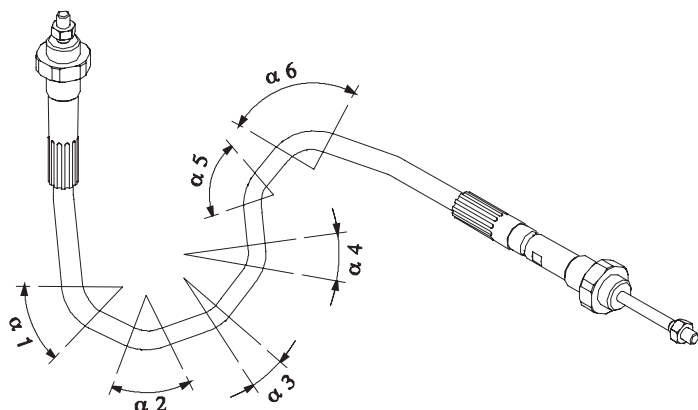
CG type: with both turning ends

CG1000	4CAV701000	Length 1000 mm - 39.37 in
CG1250	4CAV701250	Length 1250 mm - 49.21 in
CG1500	4CAV701500	Length 1500 mm - 59.05 in
CG1750	4CAV701750	Length 1750 mm - 68.90 in
CG2000	4CAV702000	Length 2000 mm - 78.74 in
CG2250	4CAV702250	Length 2250 mm - 88.58 in
CG2500	4CAV702500	Length 2500 mm - 98.42 in
CG3000	4CAV703000	Length 3000 mm - 118.11 in
CG3500	4CAV703500	Length 3500 mm - 137.79 in
CG4000	4CAV704000	Length 4000 mm - 157.48 in
CG4500	4CAV704500	Length 4500 mm - 177.16 in
CG5000	4CAV705000	Length 5000 mm - 196.85 in

4 Valve connection kit

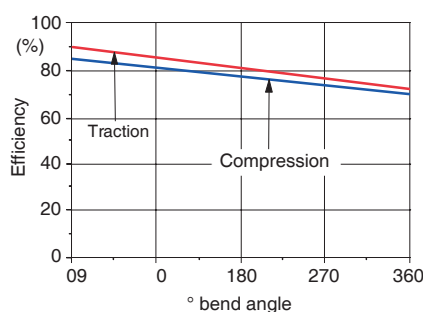
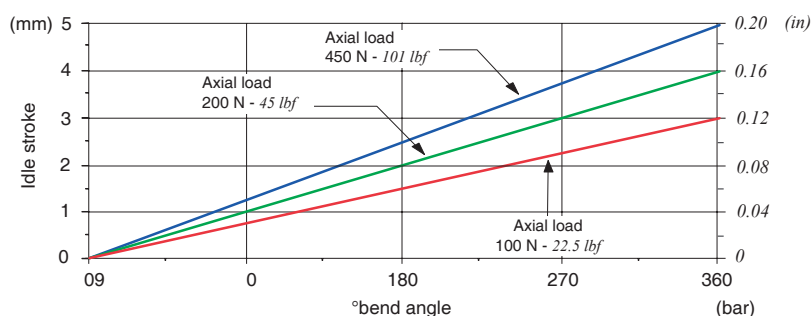
See page 19

Performances

**Total bend angle**

It results from the addition of bend curves in assembly, that are supposed calculated with minimum radius $R=150\text{ mm}$ (5.90 in)

$$\alpha_{TOT} = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \dots + \alpha_N$$

Efficiency computation**Idle stroke computation**

Connection kit

Valve connection kit		Directional control valves																													
Type	Code	SDM080-SDM081	SD4	SD5	SDM104	SDM110	SDM102-SDM103	SDM122-DLM122	SDM100	SD11	SDM140-DLM140	SDM141	SDM143-DLM142	SD14	SD18	SD6	DLS7	SD8-DLS8	SDS100	SDS140	SDS150	SDS180	DLS180	DPX050	DPX100	DPX160	SD25	DF5	DF10	DF20	
For fixing end																															
TQ05	5TEL10A100																														
TQ08	5TEL102100	•							•										•							•					
TQ50	5TEL105110		•	•		•										•													•		
TQ70	5TEL107110				•		•										•														
TQ80	5TEL108110										•	•						•		•											
TQ81	5TEL108220							•					•																		
TQ100	5TEL110110									•				•							•	•				•			•		
TQ180	5TEL118100																						•								
TQ200	5TEL120100														•												•			•	
For turning end																															
TP50	5TEL105005		•	•		•										•													•		
TP100	5TEL110005									•				•							•	•				•			•		
TP200	5TEL120005														•												•			•	
For turning end on the opposite side of the lever																															
CP50	5TEL405005		•	•		•										•			•									•			
CP100	5TEL410005									•				•							•	•							•		

Notes



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