



## DR Pressure control, swivel on one side

Pressure control keeps the pressure constant within the control range of the pump in the hydraulics system. Therefore, the pump only delivers as much fluid, as required by the actuators. The pressure may be smoothly set at the pilot valve.

Setting range 20 – 350 bar

Please note the peak pressure of 400 bar. We recommend, in order to safeguard this, a pressure relief valve e.g. DBD (RE 25402).

The min. and max. swivel angle limits may be mechanically varied up to 50 %  $V_{g,max}$ .

The pressure control is also available as a mooring model (please state this in clear text).

### Dynamic operating curves

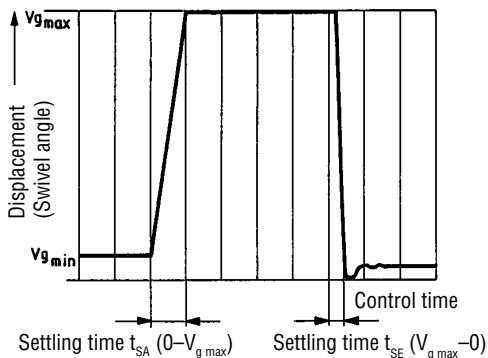
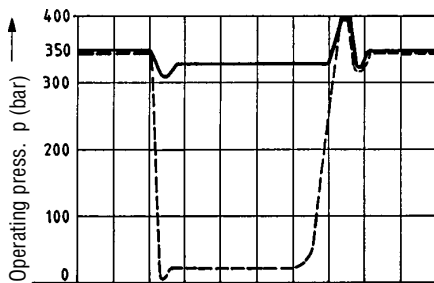
The curves are measured average values.

Conditions:  $n = 1500/1800$  rpm

$t_{oil} = 50^\circ$  C

Pressure safeguarding at 400 bar

Use pressure relief valve as a load valve 1 m downstream of the mounting flange of the axial piston unit to open and close pressure line for load jump.



### Unit dimensions

Size	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>
40	260	145	140	269	281	91	110	169	30	135
71	296	145	157	298	306	106	113	193	34	152
125	354	145	191	355	362	121	133	233	36	186
180	354	145	191	379	379	121	133	233	36	186
250	424	141	238	439	443	151	189	288	40	233
355	424	141	238	468	468	151	191	288	40	233
500	510	143	283	520	505	190	225	329	50	280
750	582	143	322	564	*	232	*	351	50	317

Size	Ports A, B	S	R(L)	E see RE 92100
40	SAE 3/4" (High pressure series)	SAE 1 1/2" (Standard pressure series)	M22x1,5; 14 deep	
71	SAE 1" (High pressure series)	SAE 2" (Standard pressure series)	M27x2; 16 deep	
125	SAE 1 1/4" (High pressure series)	SAE 2 1/2" (Standard pressure series)	M33x2; 18 deep	
180	SAE 1 1/4" (High pressure series)	SAE 3" (Standard pressure series)	M33x2; 18 deep	
250	SAE 1 1/2" (High pressure series)	SAE 3" (Standard pressure series)	M42x2; 20 deep	
355	SAE 1 1/2" (High pressure series)	SAE 4" (Standard pressure series)	M42x2; 20 deep	
500	SAE 2" (High pressure series)	SAE 5" (Standard pressure series)	M48x2; 22 deep	
750	SAE 2" (High pressure series)	SAE 5" (Standard pressure series)	M48x2;	

\* missing dimensions on request

### Ports

A, B	Pressure port
B <sub>1</sub>	Auxiliary port (plugged)
S	Suction port
S <sub>A</sub> , S <sub>B</sub>	Anti-cavitation valve port (A4VSH)
R(L)	Oil filling + bleed (case drain port)
E	Self-aspiration (A4VSG)
K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>	Flushing port (plugged)
T	Oil drain (plugged)
M <sub>A</sub> , M <sub>B</sub>	Measuring port for operating pressure (plugged)
M <sub>S</sub>	Measuring port for suction pressure (plugged)

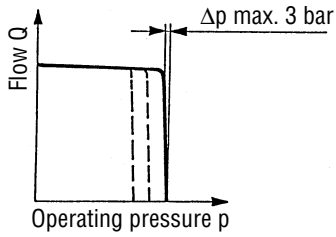
Size	t <sub>SA</sub> (s) against 20 bar	t <sub>SA</sub> (s) against 330 bar	t <sub>SE</sub> (s) Zero stroke 350 bar
40	0,050	0,030	0,020
71	0,075	0,050	0,030
125	0,100	0,070	0,040
180	0,120	0,080	0,050
250	0,150	0,100	0,060
355	0,180	0,130	0,080
500	0,200	0,150	0,100
750	0,400	0,250	0,150

In series 2 the settling time  $t_{SA}$  ( $V_{g,min} \rightarrow V_{g,max}$ ) may be smoothly varied, whereby settling time  $t_{SE}$  is not effected.

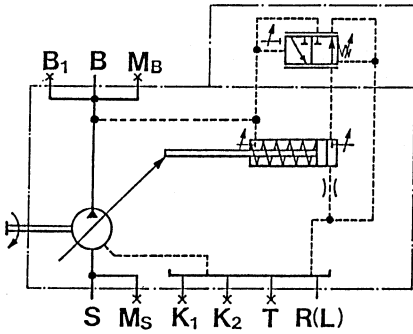
Standard setting – shortest settling time (see table). This values may be increased by a factor of approx. 2–3.

### A4VSO - open loop circuit - RE 92050

#### Operating Curve



#### Circuit

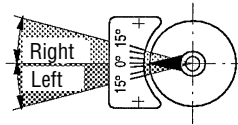


Direction of flow S to B

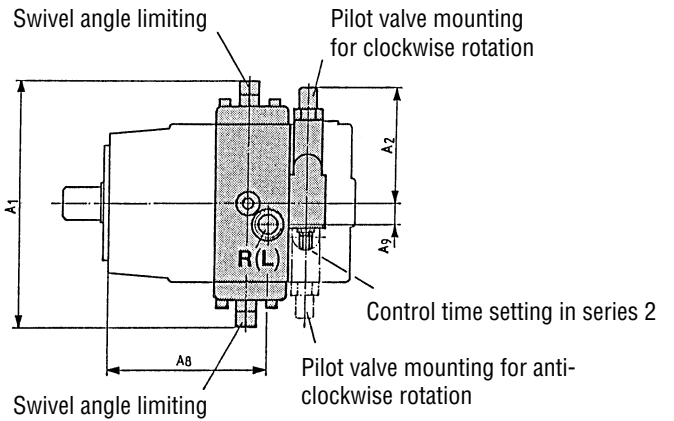
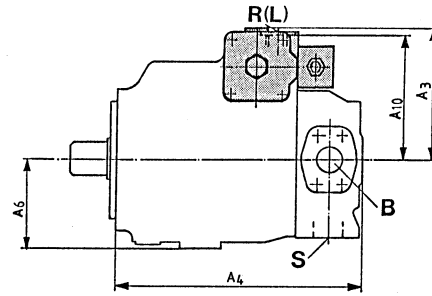
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display



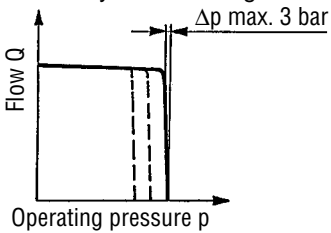
#### Unit dimensions



### A4VSG - closed loop circuit - RE 92100 A4VSH - semi-closed loop circuit - RE 92110

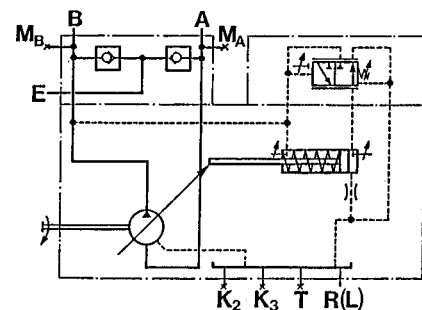
Pressure control DR may be swivelled on one side.  
Direction of rotation may not be changed.

#### Operating Curve

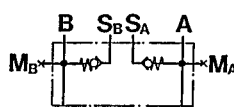


#### Circuit

A4VSG



A4VSH

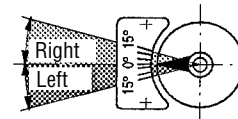


Direction of flow A to B

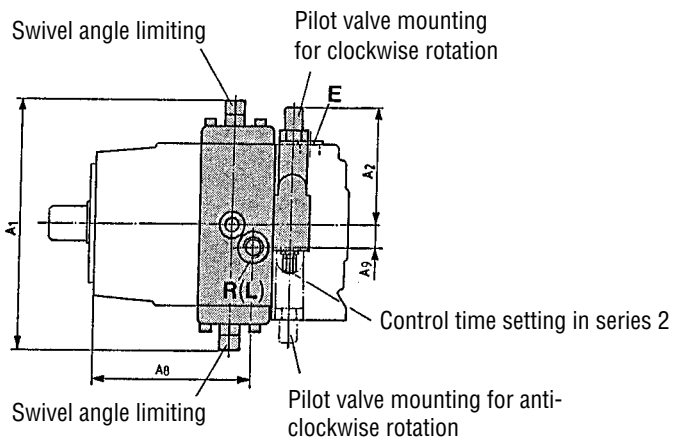
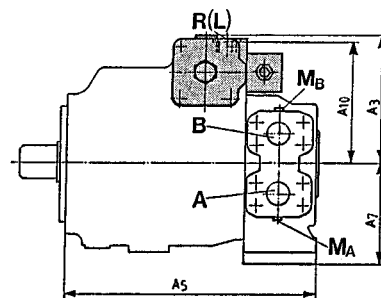
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display



#### Unit dimensions



Control devices DR, DP, FR and DFR Variable displacement pump A4VS, series 1 and 2

## DRG Remotely controlled pressure control, swivel on one side

Function and design as for DR.

A pressure relief valve may be mounted on port X for the purpose of remote control, but it is not included in the supply of the DRG.

The differential pressure at the pilot valve is set as standard to 20 bar which results in a pilot flow of 1,5 L/min. If a different setting (range: 20 – 50 bar) is required, please state it in clear text.

We recommend the following to be used as a separate pressure relief valve:

DBD 6 (hydraulic) to RE 25402,

The max. length of lines should not exceed 2 m.

### Ports

A, B	Pressure port
B <sub>1</sub>	Auxiliary port (plugged)
S	Suction port
S <sub>A</sub> , S <sub>B</sub>	Anti-cavitation valve port (A4VSH)
X	Pilot pressure port
R(L)	Oil filling + bleed (case drain port)
E	Self-aspiration (A4VSG)
K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>	Flushing port (plugged)
T	Oil drain (plugged)
M <sub>A</sub> , M <sub>B</sub>	Measuring port for operating pressure (plugged)
M <sub>S</sub>	Measuring port for suction pressure (plugged)

### Unit dimensions

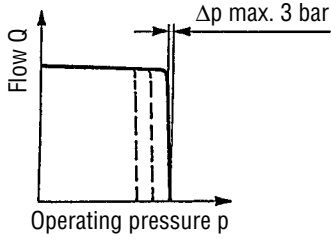
Size	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>	A <sub>12</sub>	A <sub>13</sub>
40	260	145	140	269	281	91	110	169	30	135	128	209	46
71	296	145	157	298	306	106	113	193	34	152	135,5	236	42
125	354	145	191	355	362	121	133	233	36	186	158	285	42
180	354	145	191	379	379	121	133	233	36	186	164	285	42
250	424	141	238	439	443	151	189	288	40	233	192	347	42
355	424	141	238	468	468	151	191	288	40	233	192	347	42
500	510	143	283	520	505	190	225	329	50	280	215,5	452,5	41

### Ports

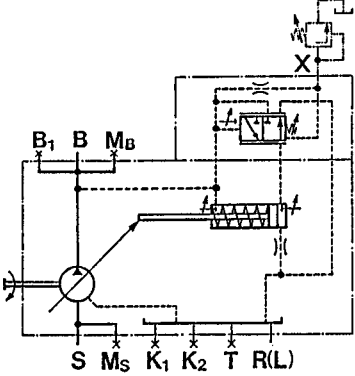
Size	A, B	S	X	R(L)	E see RE 92100
40	SAE 3/4" (High press. series)	SAE 1 1/2" (Stand. press. series)	M14x1,5; 12 deep	M22x1,5; 14 deep	
71	SAE 1" (High press. series)	SAE 2" (Stand. press. series)	M14x1,5; 12 deep	M27x2; 16 deep	
125	SAE 1 1/4" (High press. series)	SAE 2 1/2" (Stand. press. series)	M14x1,5; 12 deep	M33x2; 18 deep	
180	SAE 1 1/4" (High press. series)	SAE 3" (Stand. press. series)	M14x1,5; 12 deep	M33x2; 18 deep	
250	SAE 1 1/2" (High press. series)	SAE 3" (Stand. press. series)	M14x1,5; 12 deep	M42x2; 20 deep	
355	SAE 1 1/2" (High press. series)	SAE 4" (Stand. press. series)	M14x1,5; 12 deep	M42x2; 20 deep	
500	SAE 2" (High press. series)	SAE 5" (Stand. press. series)	M14x1,5; 12 deep	M48x2; 22 deep	

**A4VSO - open circuit - RE 92050**

**Operating Curve**



**Circuit**

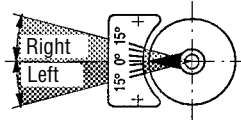


**Direction of flow** S to B

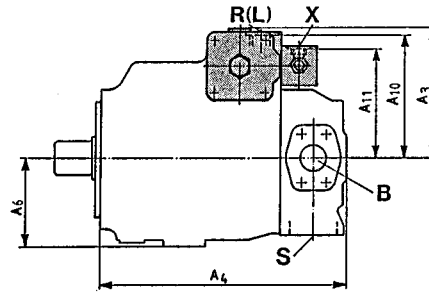
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

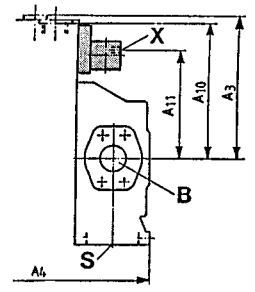
See swivel angle display



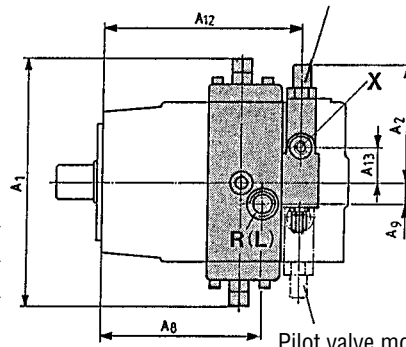
**Unit dimensions**  
Sizes 40...355



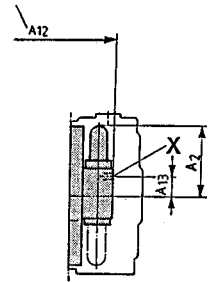
**Size 500**



Pilot valve mounting for clockwise rotation



Up to pump mounting surface



Pilot valve mounting for anti-clockwise rotation

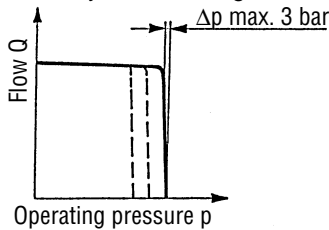
**A4VSG - closed loop circuit - RE 92100**

**A4VSH - semi closed loop circuit - RE 92110**

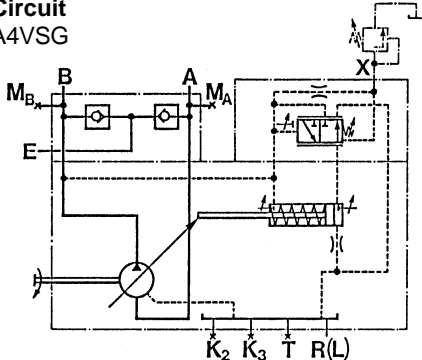
Pressure control DRG may be swivelled on one side.

Direction of rotation may not be changed.

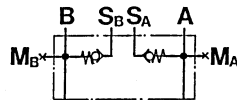
**Operating Curve**



**Circuit**  
A4VSG



A4VSH

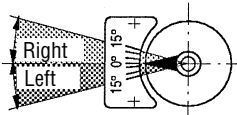


**Direction of flow** A to B

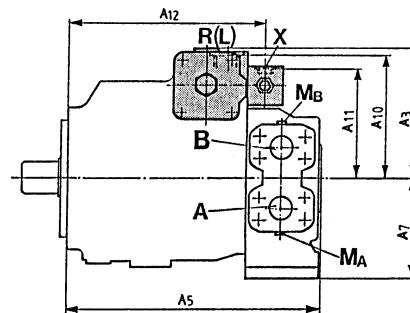
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

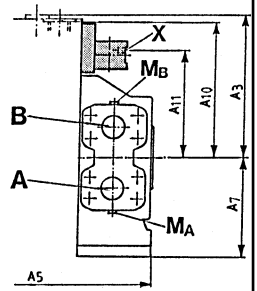
See swivel angle display



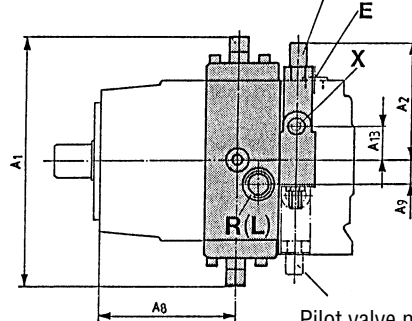
**Unit dimensions**  
Sizes 40...355



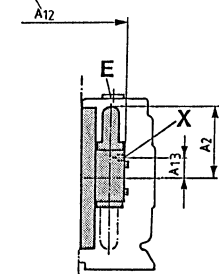
**Size 500**



Pilot valve mounting for clockwise rotation



Up to pump mounting surface



Pilot valve mounting for anti-clockwise rotation

## DP Pressure control for parallel operation, swivel on one side

Suitable for pressure control of several axial piston units A4VS in parallel operation.

Setting range 33 – 350 bar

Pressure relief valve (4) is used to control several axial piston units simultaneously via their X ports. The relevant throttle valve (3) ensures control of the required pressure increase, which is proportional to the actual pump position.

Pressure relief valve (4) is not included in the supply for the DP - please order separately.

Recommendation: DBD 6 (hydraulic) RE 25402

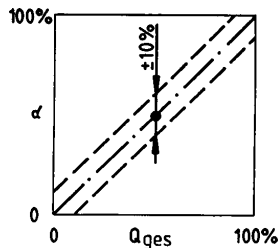
Pressure control DP may also be supplied as a mooring model (please state in clear text).

The lines from ports X to the pressure relief valve should be more or less of the same length.

Accuracy of parallel control may, if required, be re-adjusted via the operating pressure of pressure compensator (2).

Min. and max. swivel angle limits may be varied mechanically up to 50 %  $V_{g\max}$ .

Pilot oil flow per pump: approx. 1,5 L/min



Swivel angle deviation  $\pm 10\%$  of ideal curve

### Components

- 1 A4VSO/G with hydraulic positioning device
  - 2 Pressure compensator
  - 3 Throttle valve
  - 4 Pressure relief valve
  - 5 Bleed valve
  - 6 Self aspiration
- } Not included in supply

In series 2, the delivery time  $t_{SA}(V_{g\min} \rightarrow V_{g\max})$  may be smoothly varied, whereby the settling time  $t_{SE}$  is not affected.

Standard setting – shortest settling time (see table). These values may be increased by a factor of approx. 2–3.

### Unit dimensions

Size	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>	A <sub>12</sub>	A <sub>13</sub>	A <sub>14</sub>
40	260	145	208	269	281	91	110	169	30	135	169,5	144	11,5	38
71	296	145	225	298	306	106	113	193	34	152	186,5	166	11,5	38
125	354	145	259	355	362	121	133	233	36	186	220	203	11,5	38
180	354	145	259	379	379	121	133	233	36	186	220	203	11,5	38
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355	424	141	306	468	468	151	191	288	40	233	267,5	248	11,5	38
500	510	143	351	520	505	190	225	329	50	280	312,5	279	11,5	38
750	582	143	389	564	*	232	*	351	50	317	350,5	301	11,5	38

Size	Ports		S		R(L)		E see RE 92100		X
	A, B								
40	SAE 3/4"	(High press. series)	SAE 1 1/2"	(Stand. press. series)	M22x1,5; 14 deep			M14x1,5; 12 d.	
71	SAE 1"	(High press. series)	SAE 2"	(Stand. press. series)	M27x2; 16 deep			M14x1,5; 12 d.	
125	SAE 1 1/4"	(High press. series)	SAE 2 1/2"	(Stand. press. series)	M33x2; 18 deep			M14x1,5; 12 d.	
180	SAE 1 1/4"	(High press. series)	SAE 3"	(Stand. press. series)	M33x2; 18 deep			M14x1,5; 12 d.	
250	SAE 1 1/2"	(High press. series)	SAE 3"	(Stand. press. series)	M42x2; 20 deep			M14x1,5; 12 d.	
355	SAE 1 1/2"	(High press. series)	SAE 4"	(Stand. press. series)	M42x2; 20 deep			M14x1,5; 12 d.	
500	SAE 2"	(High press. series)	SAE 5"	(Stand. press. series)	M48x2; 22 deep			M14x1,5; 12 d.	
750	SAE 2"	(High press. series)	SAE 5"	(Stand. press. series)	M48x2;			M14x1,5; 12 d.	

\* missing dimensions on request

### Ports

- A, B Pressure port
- X Pilot pressure port
- B<sub>1</sub> Auxiliary port (plugged)
- S Suction port
- S<sub>A</sub>, S<sub>B</sub> Anti-cavitation valve port (A4VSH)
- R(L) Oil filling + bleed (case drain port)
- E Self-aspiration (A4VSG)
- K<sub>1</sub>, K<sub>2</sub>, K<sub>3</sub> Flushing port (plugged)
- T Oil drain (plugged)
- M<sub>A</sub>, M<sub>B</sub> Measuring port for operating pressure (plugged)
- M<sub>S</sub> Measuring port for suction pressure (plugged)
- M<sub>St</sub> Measuring port for pilot pressure (plugged)

### Dynamic operating curves

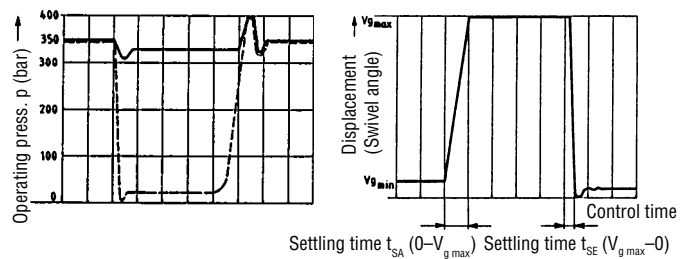
The curves are measured average values.

Conditions: n = 1500/1800 rpm

t<sub>oil</sub> = 50° C

Pressure safeguarding at 400 bar

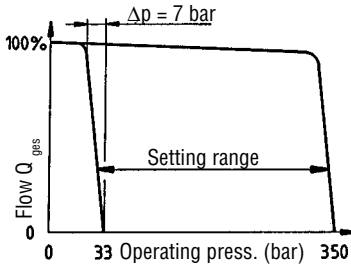
In order to prevent pulses when opening or closing the pressure line, fit a press. relief valve in downstream from the pump outlet.



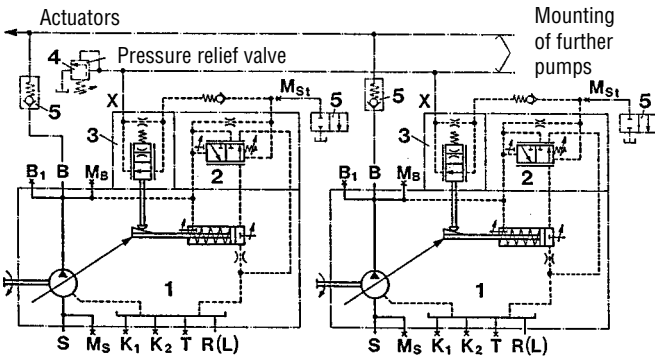
Size	t <sub>SA</sub> (s)	t <sub>SA</sub> (s)	t <sub>SE</sub> (s)
	against 20 bar	against 330 bar	Zero stroke 350 bar
40	0,050	0,030	0,020
71	0,075	0,050	0,030
125	0,100	0,070	0,040
180	0,120	0,080	0,050
250	0,150	0,100	0,060
355	0,180	0,130	0,080
500	0,200	0,150	0,100
750	on request		

### A4VSO - open loop circuit - RE 92050

#### Operating Curve



#### Circuit

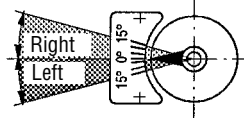


Direction of flow **S to B**

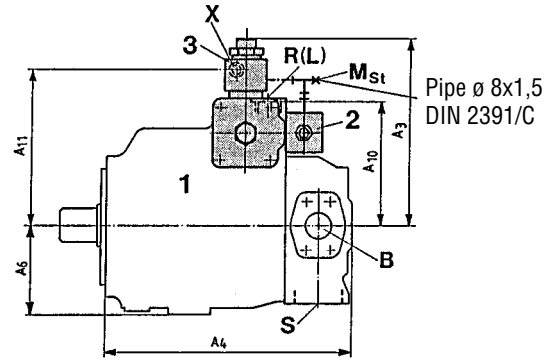
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display

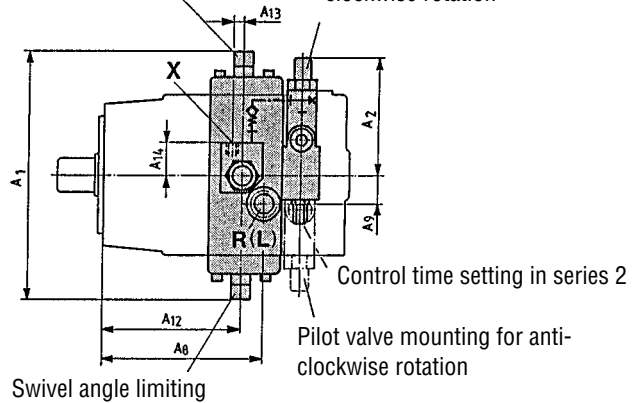


#### Unit dimensions



Swivel angle limiting

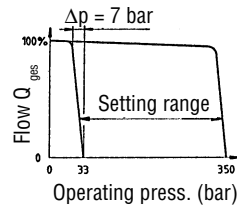
Pilot valve mounting for clockwise rotation



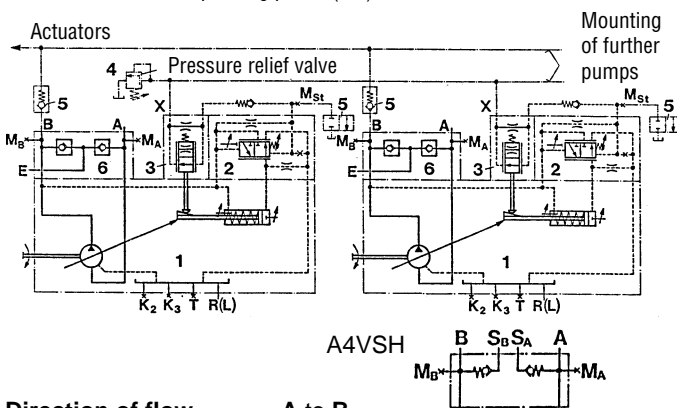
### A4VSG - closed loop circuit - RE 92100 A4VSH - semi-closed loop circuit - RE 92110

Pressure control DP may be swivelled on one side only. Direction of rotation may not be changed.

#### Operating Curve



#### Circuit

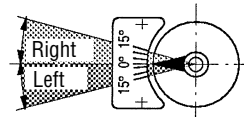


Direction of flow **A to B**

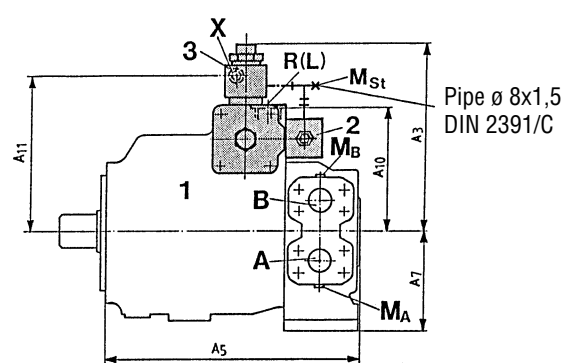
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display

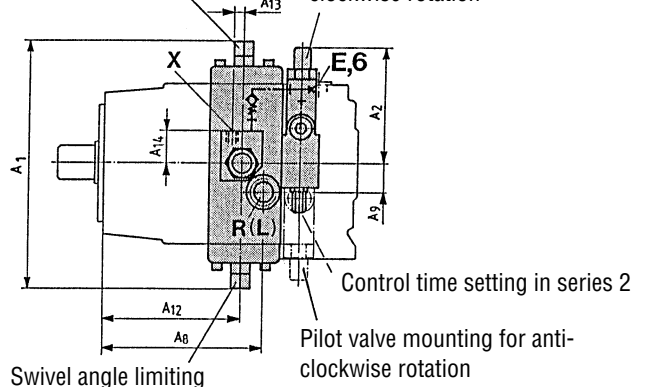


#### Unit dimensions



Swivel angle limiting

Pilot valve mounting for clockwise rotation



## DPF Pressure control for parallel operation, with flow control

In addition to pressure control, the flow from pumps may be varied via a differential pressure at the actuator (e.g. by means of an orifice).

Min. and max. swivel angle limits may be mechanically varied up to 50 %  $V_{g \max}$ .

See page 6 for function and technical data of parallel pressure control DP.

### Dynamic operating curves

The curves are measured average values.

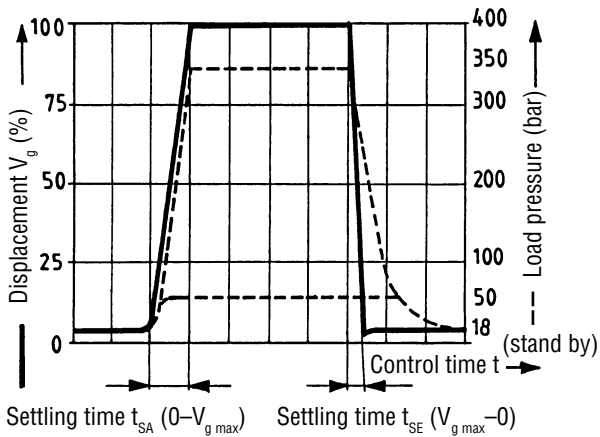
Flow jump stand by/ $Q_{\max}$  by means of unloading X port to tank.

### Ports

B	Pressure port
$X_1, X_2$	Pilot pressure port
$B_1$	Auxiliary port (plugged)
S	Suction port
R(L)	Oil filling + bleed (case drain port)
$K_1, K_2$	Flushing port (plugged)
T	Oil drain (plugged)
$M_B$	Measuring port for operating pressure (plugged)
$M_S$	Measuring port for suction pressure (plugged)
$M_{st}$	Measuring port for pilot pressure (plugged)

### Components

- 1 A4VSO with hydraulic positioning device
  - 2 Pressure compensator
  - 3 Throttle valve
  - 4 Pressure relief valve
  - 5 Bleed valve
  - 6 Flow control valve
- } Not included in supply



Size	$t_{SA}$ (s) stand by-350 bar	$t_{SE}$ (s) 350 bar-stand by	$t_{SE}$ (s) 50 bar-stand by
40	0,050	0,020	0,050
71	0,080	0,030	0,075
125	0,120	0,040	0,100
180	0,140	0,050	0,120
250	0,170	0,060	0,150
355	0,200	0,070	0,180

In series 2, the delivery time  $t_{SA}$  ( $V_{g \min} \rightarrow V_{g \max}$ ) may be smoothly varied, whereby the settling time  $t_{SE}$  is not effected.

Standard setting – shortest settling time (see table). These values may be increased by a factor of approx. 2–3.

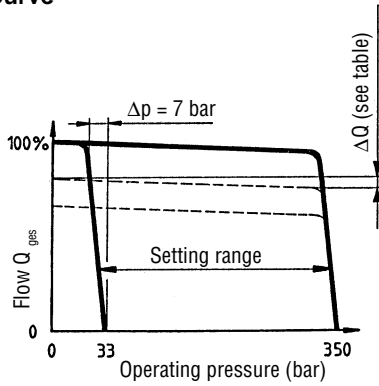
### Unit dimensions

Size	$A_1$	$A_2$	$A_3$	$A_4$	$A_6$	$A_8$	$A_9$	$A_{10}$	$A_{11}$	$A_{12}$	$A_{13}$	$A_{14}$	$A_{15}$	$A_{16}$	$A_{17}$	$A_{18}$
40	260	145	208	269	91	169	30	135	169,5	144	11,5	38	46	249	128	275
71	296	145	225	298	106	193	34	152	186,5	166	11,5	38	42	276	135,5	302
125	354	145	259	355	121	233	36	186	220	203	11,5	38	42	325	158	355
180	354	145	259	379	121	233	36	186	220	203	11,5	38	42	325	164	355
250	424	141	306	439	151	288	40	233	267,5	248	11,5	38	42	387	192	416
355	424	141	306	468	151	288	40	233	267,5	248	11,5	38	42	387	192	416

Size	Ports B	S	R(L)	X
40	SAE 3/4" (High press. series)	SAE 1 1/2" (Stand. press. series)	M22x1,5; 14 deep	M14x1,5; 12 deep
71	SAE 1" (High press. series)	SAE 2" (Stand. press. series)	M27x2; 16 deep	M14x1,5; 12 deep
125	SAE 1 1/4" (High press. series)	SAE 2 1/2" (Stand. press. series)	M33x2; 18 deep	M14x1,5; 12 deep
180	SAE 1 1/4" (High press. series)	SAE 3" (Stand. press. series)	M33x2; 18 deep	M14x1,5; 12 deep
250	SAE 1 1/2" (High press. series)	SAE 3" (Stand. press. series)	M42x2; 20 deep	M14x1,5; 12 deep
355	SAE 1 1/2" (High press. series)	SAE 4" (Stand. press. series)	M42x2; 20 deep	M14x1,5; 12 deep

### A4VSO - open loop circuit - RE 92050

#### Operating Curve

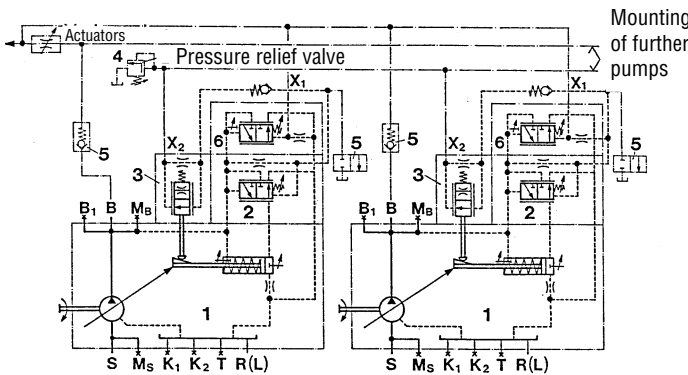


#### Max. flow deviation

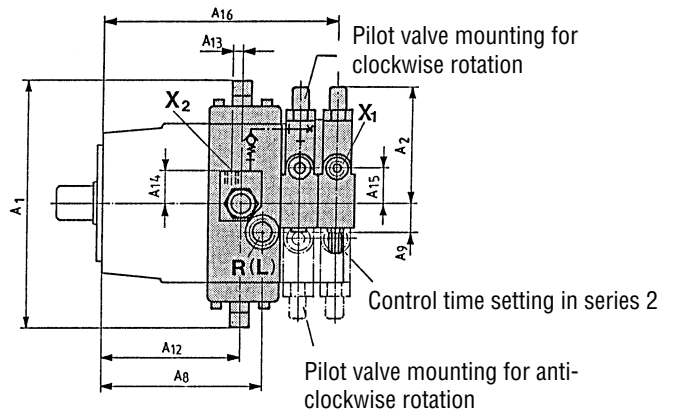
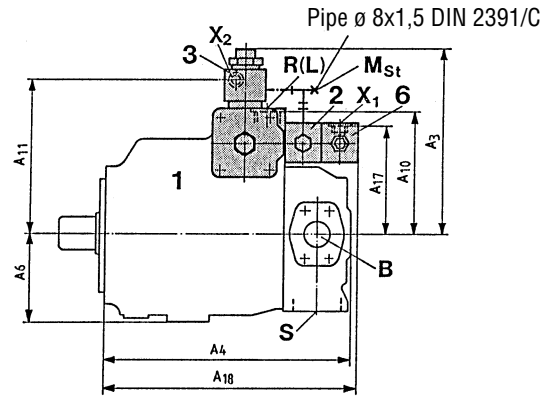
Measured at speed n = 1500 rpm

Size	40	71	125	180	250	355
ΔQ L/min	2	3	5	6	8	10

#### Circuit



#### Unit dimensions

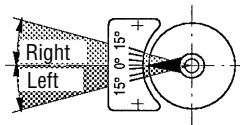


**Direction of flow**      **S to B**

Clockwise rotation –      left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display



## FR/FR1 Flow control

Pump flow may be varied by means of a differential pressure at the actuator (e.g. via an orifice).

In model FR1 the orifice is enclosed in the X port.

Min. and max. swivel angle limits may be mechanically varied up to 50 %  $V_{g \max}$ .

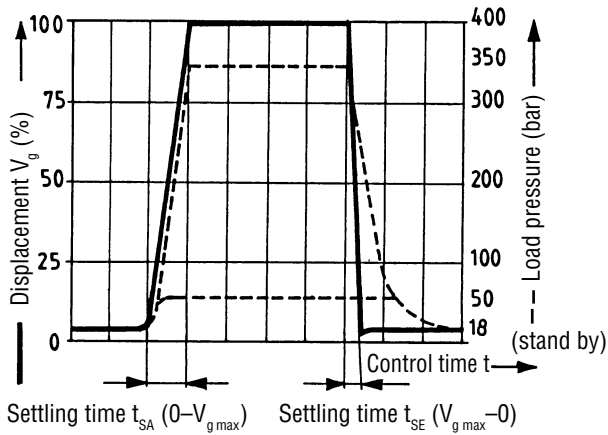
### Dynamic operating curves

The curves are measured average values.

Flow jump stand by/ $Q_{\max}$  by means of unloading X port to tank.

### Ports

B	Pressure port
B <sub>1</sub>	Auxiliary port (plugged)
S	Suction port
R(L)	Oil filling + bleed (case drain port)
X	Pilot pressure port
K <sub>1</sub> , K <sub>2</sub>	Flushing port (plugged)
T	Oil drain (plugged)
M <sub>B</sub>	Measuring port for operating pressure (plugged)
M <sub>S</sub>	Measuring port for suction pressure (plugged)



Size	$t_{SA}$ (s)	$t_{SE}$ (s)	$t_{SE}$ (s)
	stand by-350 bar	350 bar-stand by	50 bar-stand by
40	0,050	0,020	0,050
71	0,080	0,030	0,075
125	0,120	0,040	0,100
180	0,140	0,050	0,120
250	0,170	0,060	0,150
355	0,200	0,070	0,180
500	0,240	0,080	0,210

In series 2, the delivery time  $t_{SA}$  ( $V_{g \min} \rightarrow V_{g \max}$ ) may be smoothly varied, whereby the settling time  $t_{SE}$  is not effected.

Standard setting – shortest settling time (see table). These values may be increased by a factor of approx. 2–3.

### Unit dimensions

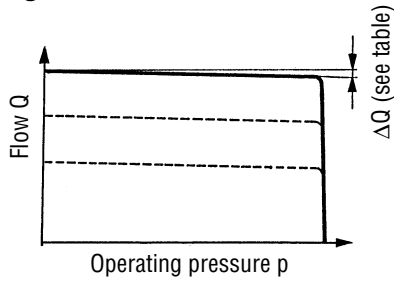
Size	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>6</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>	A <sub>12</sub>	A <sub>13</sub>
40	260	145	140	269	91	169	30	135	128	209	46
71	296	145	157	298	106	193	34	152	135,5	236	42
125	354	145	191	355	121	233	36	186	158	285	42
180	354	145	191	379	121	233	36	186	164	285	42
250	424	141	238	439	151	288	40	233	192	347	42
355	424	141	238	468	151	288	40	233	192	347	42
500	510	143	283	520	190	329	50	280	215,5	452	41

### Ports

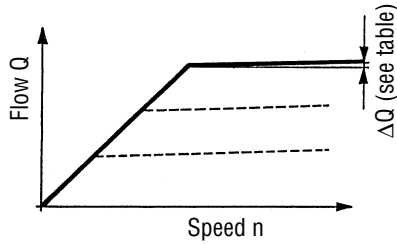
Size	B	S	X	R(L)
40	SAE 3/4" (High press. series)	SAE 1 1/2" (Stand. press. series)	M14x1,5; 12 deep	M22x1,5; 14 deep
71	SAE 1" (High press. series)	SAE 2" (Stand. press. series)	M14x1,5; 12 deep	M27x2; 16 deep
125	SAE 1 1/4" (High press. series)	SAE 2 1/2" (Stand. press. series)	M14x1,5; 12 deep	M33x2; 18 deep
180	SAE 1 1/4" (High press. series)	SAE 3" (Stand. press. series)	M14x1,5; 12 deep	M33x2; 18 deep
250	SAE 1 1/2" (High press. series)	SAE 3" (Stand. press. series)	M14x1,5; 12 deep	M42x2; 20 deep
355	SAE 2" (High press. series)	SAE 4" (Stand. press. series)	M14x1,5; 12 deep	M42x2; 20 deep
500	SAE 2" (High press. series)	SAE 5" (Stand. press. series)	M14x1,5; 12 deep	M48x2; 22 deep

### A4VSO - open loop circuit - RE 92050

#### Static operating curve



#### Static operating curve for variable speeds

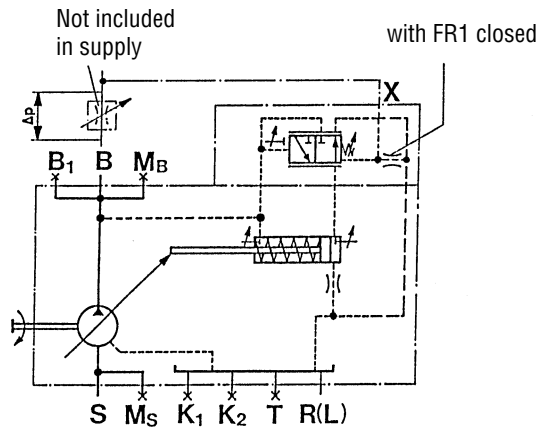


#### Max. flow deviation

Measured at drive speed  $n = 1500$  rpm

Size	40	71	125	180	250	355	500
$\Delta Q$ L/min	2	3	5	6	8	10	12

#### Circuit

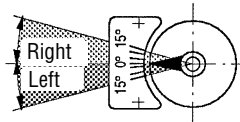


Direction of flow **S to B**

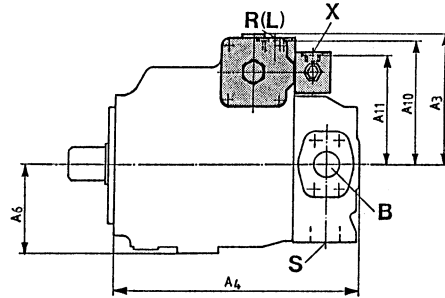
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

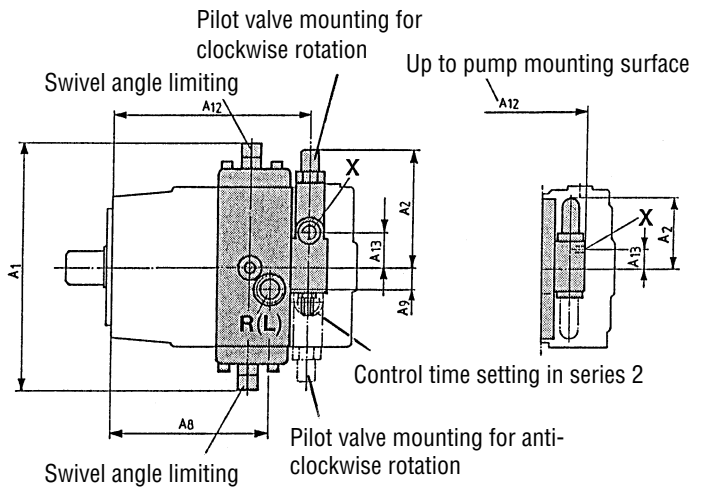
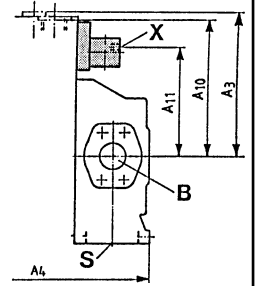
See swivel angle display



#### Unit dimensions Sizes 40...355



#### Size 500



Control devices DR, DP, FR and DFR Variable displacement pump A4VS, series 1 and 2

## FRG/FRG1 Flow control with remotely controlled pressure control

Pressure control overrides flow control. Flow control is controlled by means of a separate pressure relief valve.

A pressure relief valve may be mounted on to port  $X_2$  for the purpose of remote control, but it is not included in the supply of the FRG.

The differential pressure at the pilot valve is set as standard to 20 bar and results in a flow of 1,5 L/min. If a different setting (range: 20 – 50 bar) is required, please state it in clear text.

As the separate pressure relief valve, we recommend the following:

- DBD 6 (hydraulic) to RE 25402,
- DBET 30 (electrical) to RE 29142 or
- DBETR -SO 381 with orifice 0,8 in P (electrical) to RE 29166

The max. line length of 2 m must not be exceeded.

Min. and max. swivel angle limits may be mechanically varied up to 50 %  $V_{g\max}$ .

For the function and technical data of the flow control FR see page 10.

In model FRG1 the orifice is enclosed in the X port.

### Ports

B	Pressure port
$X_1, X_2$	Pilot pressure port
$B_1$	Auxiliary port (plugged)
S	Suction port
R(L)	Oil filling + bleed (case drain port)
$K_1, K_2$	Flushing port (plugged)
T	Oil drain (plugged)
$M_B$	Measuring port for operating pressure (plugged)
$M_S$	Measuring port for suction pressure (plugged)

### Components

- 1 A4VSO with hydraulic positioning device
- 2 Pressure control valve
- 3 Flow control valve

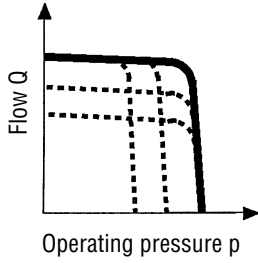
### Unit dimensions

Size	$A_1$	$A_2$	$A_3$	$A_4$	$A_6$	$A_8$	$A_9$	$A_{10}$	$A_{12}$	$A_{14}$	$A_{15}$	$A_{16}$	$A_{17}$	$A_{18}$
40	260	145	140	269	91	169	30	135	144	209	46	249	128	275
71	296	145	157	298	106	193	34	152	166	236	42	276	135,5	302
125	354	145	191	355	121	233	36	186	203	285	42	325	158	355
180	354	145	191	379	121	233	36	186	203	285	42	325	164	355
250	424	141	238	439	151	288	40	233	248	342	42	387	192	416
355	424	141	238	468	151	288	40	233	248	342	42	387	192	416

Size	Ports				
	B	S		R(L)	$X_1, X_2$
40	SAE 3/4" (High press. series)	SAE 1 1/2" (Stand. press. series)		M22x1,5; 14 deep	M14x1,5; 12 deep
71	SAE 1" (High press. series)	SAE 2" (Stand. press. series)		M27x2; 16 deep	M14x1,5; 12 deep
125	SAE 1 1/4" (High press. series)	SAE 2 1/2" (Stand. press. series)		M33x2; 18 deep	M14x1,5; 12 deep
180	SAE 1 1/4" (High press. series)	SAE 3" (Stand. press. series)		M33x2; 18 deep	M14x1,5; 12 deep
250	SAE 1 1/2" (High press. series)	SAE 3" (Stand. press. series)		M42x2; 20 deep	M14x1,5; 12 deep
355	SAE 1 1/2" (High press. series)	SAE 4" (Stand. press. series)		M42x2; 20 deep	M14x1,5; 12 deep

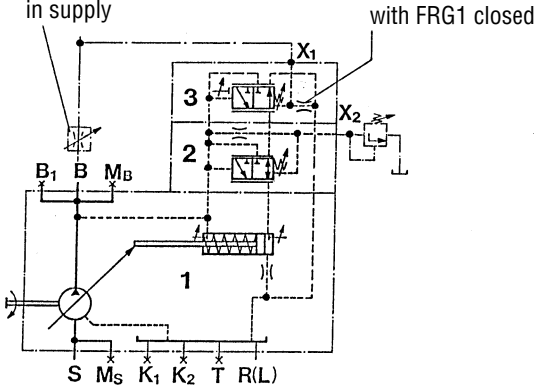
### A4VSO - open loop circuit - RE 92050

#### Operating curve



#### Circuit

Not included in supply

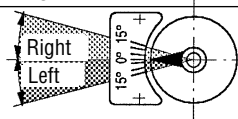


**Direction of flow** S to B

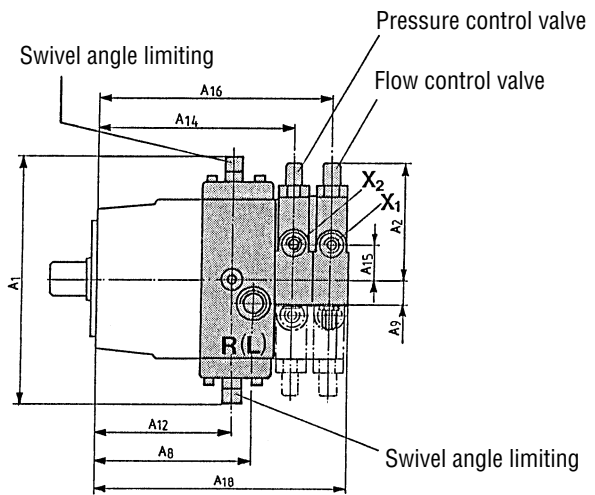
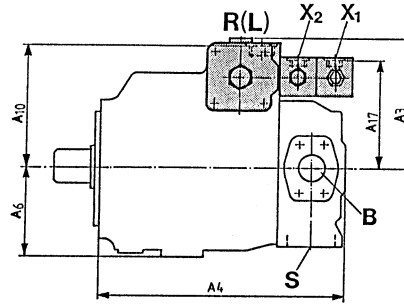
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display



#### Unit dimensions



Control devices DR, DP, FR and DFR Variable displacement pump A4VS, series 1 and 2

## DFR/DFR1 Pressure/flow control

Pressure and flow control DFR is a combination of pressure control DR and flow control FR.

For function and technical data see DR (page 2) and FR (page 10).

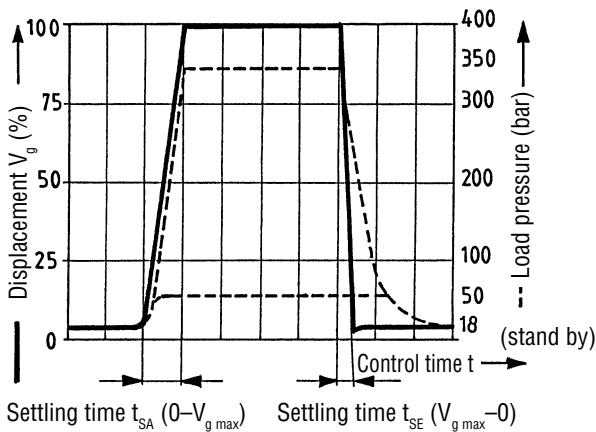
In model DFR1, the orifice is enclosed in port X.

Min. and max. swivel angle limits may be mechanically varied up to 50 %  $V_{g \max}$ .

### Dynamic operating curve

The curves are measured average values.

Flow jump stand by/ $Q_{\max}$  by means of unloading X port to tank.



Size	$t_{SA}$ (s) stand by-350 bar	$t_{SE}$ (s) 350 bar-stand by	$t_{SE}$ (s) 50 bar-stand by
40	0,050	0,020	0,050
71	0,080	0,030	0,075
125	0,120	0,040	0,100
180	0,140	0,050	0,120
250	0,170	0,060	0,150
355	0,200	0,070	0,180

In series 2, the delivery time  $t_{SA}$  ( $V_{g \min} \rightarrow V_{g \max}$ ) may be smoothly varied, whereby the settling time  $t_{SE}$  is not effected.

Standard setting – shortest settling time (see table). These values may be increased by a factor of approx. 2–3.

### Unit dimensions

Size	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>6</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>12</sub>	A <sub>15</sub>	A <sub>16</sub>	A <sub>17</sub>	A <sub>18</sub>
40	260	145	140	269	91	169	30	135	144	46	249	128	275
71	296	145	157	298	106	193	34	152	166	42	276	135,5	302
125	354	145	191	355	121	233	36	186	203	42	325	158	355
180	354	145	191	379	121	233	36	186	203	42	325	164	355
250	424	141	238	439	151	288	40	233	248	42	387	192	416
355	424	141	238	468	151	288	40	233	248	42	387	192	416

Size	Ports			
	B	S	R(L)	X
40	SAE 3/4" (High press. series)	SAE 1 1/2" (Stand. press. series)	M22x1,5; 14 deep	M14x1,5; 12 deep
71	SAE 1" (High press. series)	SAE 2" (Stand. press. series)	M27x2; 16 deep	M14x1,5; 12 deep
125	SAE 1 1/4" (High press. series)	SAE 2 1/2" (Stand. press. series)	M33x2; 18 deep	M14x1,5; 12 deep
180	SAE 1 1/4" (High press. series)	SAE 3" (Stand. press. series)	M33x2; 18 deep	M14x1,5; 12 deep
250	SAE 1 1/2" (High press. series)	SAE 3" (Stand. press. series)	M42x2; 20 deep	M14x1,5; 12 deep
355	SAE 1 1/2" (High press. series)	SAE 4" (Stand. press. series)	M42x2; 20 deep	M14x1,5; 12 deep

### Ports

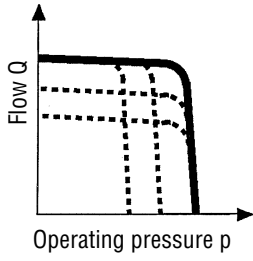
B	Pressure port
X	Pilot pressure port
B <sub>1</sub>	Auxiliary port (plugged)
S	Suction port
R(L)	Oil filling + bleed (case drain port)
K <sub>1</sub> , K <sub>2</sub>	Flushing port (plugged)
T	Oil drain (plugged)
M <sub>B</sub>	Measuring port for operating pressure (plugged)
M <sub>S</sub>	Measuring port for suction pressure (plugged)

### Components

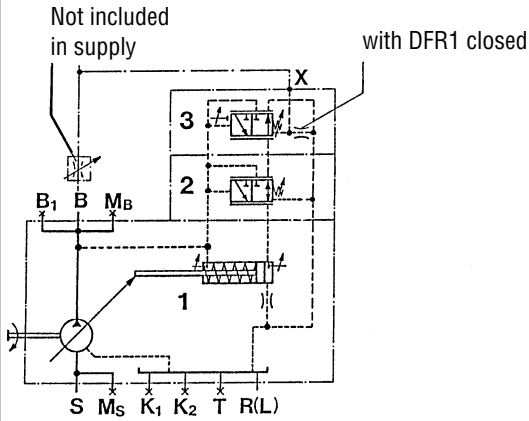
- 1 A4VSO with hydraulic positioning device
- 2 Pressure control valve
- 3 Flow control valve

### A4VSO - open loop circuit - RE 92050

#### Operating Curve



#### Circuit

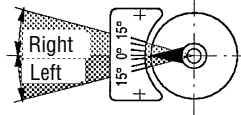


**Direction of flow**      **S to B**

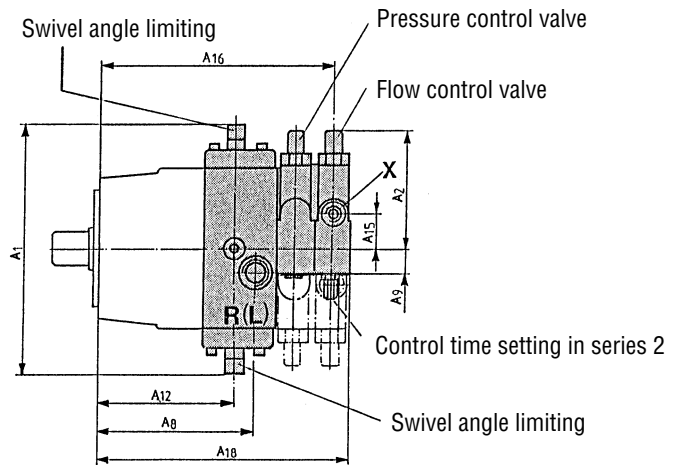
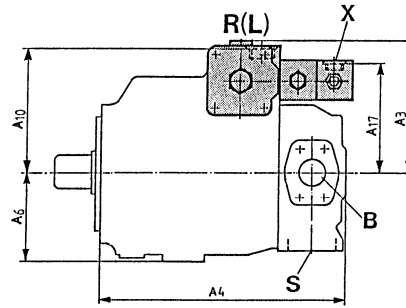
Clockwise rotation – left swivel range

Anti-clockwise rotation – right swivel range

See swivel angle display



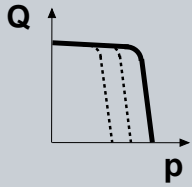
#### Unit dimensions



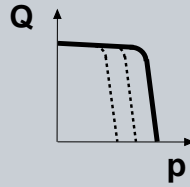
**Control devices A4VS**

**RE 92060**

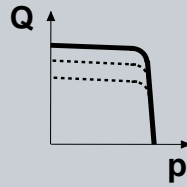
Pressure control **DR**



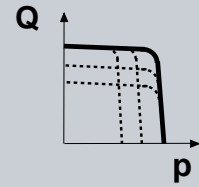
Pressure control for parallel operation **DP**



Flow control **FR**

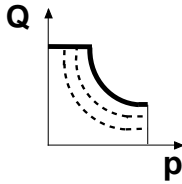


Pressure and flow control **DFR**

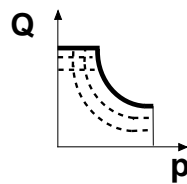


**RE 92064**

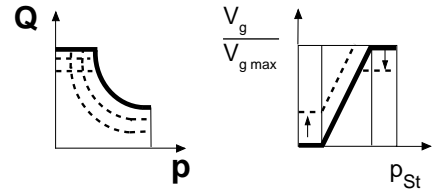
Power control with hyperbolic operating curve **LR2**



Power control with remotely controlled power characteristic **LR3**

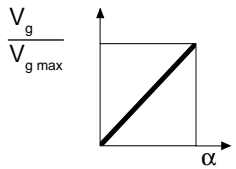


Hydraulic control dependent on pilot pressure **LR2N**



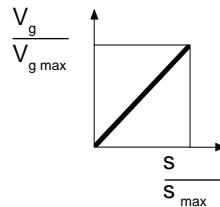
**RE 92068 (in preparation)**

Hydraulic control dependent on displacement **HW**

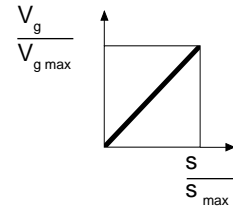


**RE 92072**

Manual control **MA**



Electro-motive control **EM**

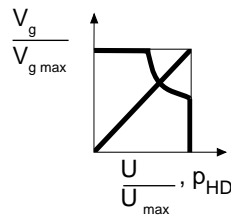


**RE 92076**

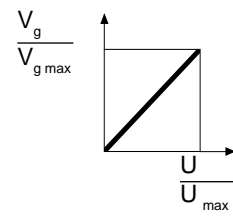
Hydraulic flow control dependent on flow **HM 1/2**

Application: - 2 point circuit  
- Basic unit for servo or proportional control

Hydraulic flow control **HS / HSP**

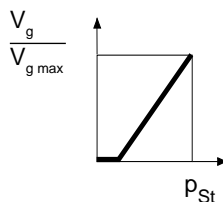


Hydraulic flow control **EO1**



**RE 92080**

Hydraulic control, dependent on pilot pressure **HD**



**RE 92055**

Speed control, secondary controlled **DS1**

