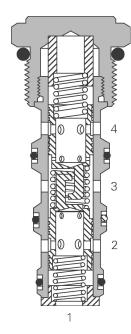
Inlet flow passes through the two matched orifices in the spools, through the spools and out of the radial holes in the sleeve. The matched orifices and the compensating springs ensure that the flow is divided equally, excess flow in either

direction causes the spool to move and close the radial holes in the sleeve until equilibrium is restored. In the reverse direction the spools close together and regulate the flow in through the radial ports.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions. Cartridge construction gives versatility of application. A valve may be fitted into a line body, a custom designed Hydraulic Integrated Circuit or other hydraulic equipment.

Sectional view



Performance data

Ratings and specifications

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)	
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated inlet flow	See model code
Temperature range	-40° to 120° C (-40° to 248° F)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as MIL—H—5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ 16/13
Standard housing materials	Aluminum
Weight cartridge only	0,35 kg (0.78 lbs)
Seal Kits	889634 (Buna—N) 889638 (Viton®)

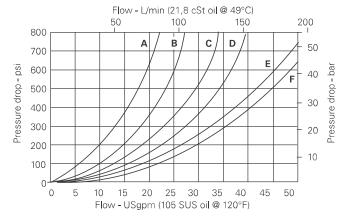
Viton is a registered trademark of E.I. DuPont

Description

This range of flow divider/ combiner valves gives division of input flow into two equal parts and re-combination of flow in the reverse direction. Pressure compensation ensures that whether dividing or combining, equal flow is maintained over a wide range of pressure variation. A typical use of these valves is to divide a pump flow to operate two actuators (which may be under different load conditions and at different pressures) and to re-combine the return flows to synchronize actuator movement. Flow variation is within ±10% with the maximum variation of pressure and inlet flow and under normal conditions will be significantly less.

Pressure drop

Cartridge only



Flow division

(See model code position 5)

A - 2* spool **D** - 5* spool **B** - 3* spool **E** - 6* spool **C** - 4* spool **F** - 8* spool

FDC1 - Flow divider/combiner

3 Seals
Blank - Buna-N
V - Viton®

2 Size

16 - 16 size

4 Port size

Code	Port size	Housing number	
		Aluminium light duty	
0	Cartridge only		
12T	SAE 12	566200	
6B	3/4" BSPP	02-175468	

5 Flow divisions (Ratios)

Code	Flow division %		Rated inlet flow	
	Port 4	Port 2	L/min	(USgpm)
22	50	50	045,6	(12)
28	20	80	114,0	(30)
33	50	50	068,0	(18)
36	33	67	098,0	(26)
43	57	43	079,0	(21)
44	50	50	090,0	(24)
46	40	60	114,0	(30)
55	50	50	114,0	(30)
62	75	25	090,0	(24)
63	67	33	098,0	(26)
64	60	40	114,0	(30)
66	50	50	132,0	(35)
82	80	20	114,0	(30)
84	67	33	132,0	(35)
88	50	50	178,0	(47)

Н

H-115

Dimensions

mm (inch)

Cartridge only Basic code

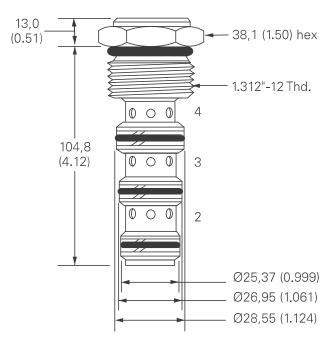
FDC1-16

Torque cartridge in aluminum housing to 108–122 Nm (80–90 ft lbs)

6 Special features

00 - Non

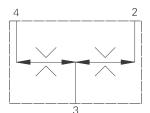
(Only required if valve has special features, omitted if "00".)



Notes: Port 1, unused, blocked by blind cavity.

Minimum inlet flow should not be less than 1/4 of maximum inlet flow for a given code.

Pressure compensated, spool type Up to 140 L/min (37 USgpm) • 350 bar (5000 psi)



Operation

Inlet flow passes through the two matched orifices in the spools, through the spools and out of the radial holes in the sleeve. The matched orifices and the compensating springs ensure that the flow is divided equally, excess flow in either direction causes the spool to

move and close the radial holes in the sleeve until equilibrium is restored. In the reverse direction the spools close together and regulate the flow in through the radial ports.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions. Cartridge construction gives versatility of application. A valve may be fitted into a line body, a custom designed Hydraulic Integrated Circuit or other hydraulic equipment.

Sectional view

4 3 3

Performance data

Ratings and specifications

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)	
Typical application pressure (all ports)	350 bar (5000 psi)
Cartridge fatigue pressure (infinite life)	350 bar (5000 psi)
Rated inlet flow	See model code
Temperature range	-40° to 120° C (-40° to 248° F)
Cavity	C-16-4
Fluids	All general purpose hydraulic fluids such as MIL—H—5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ 16/13
Standard housing materials	Aluminum or steel
Weight cartridge only	0,35 kg (0.78 lbs)
Seal Kits	889634 (Buna—N) 889638 (Viton®)

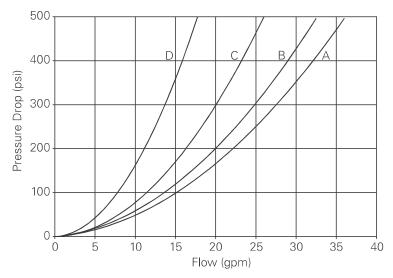
Viton is a registered trademark of E.I. DuPont

Description

This range of flow divider/ combiner valves gives division of input flow into two equal parts and re-combination of flow in the reverse direction. Pressure compensation ensures that whether dividing or combining, equal flow is maintained over a wide range of pressure variation. A typical use of these valves is to divide a pump flow to operate two actuators (which may be under different load conditions and at different pressures) and to re-combine the return flows to synchronize actuator movement. Flow variation is within ±10% with the maximum variation of pressure and inlet flow and under normal conditions will be significantly less.

Pressure drop

Cartridge only



Flow division

A - 66 **C** - 33 **B** - 44 **D** - 22

FDC11 - Flow divider/combiner

3 Seals
Blank - Buna-N
V - Viton®

2 Size

16 - 16 size

4 Port size

Code	Port size	Housing number	
		Aluminium	Steel
A12T	SAE 12	20785*	
A6B	3/4" BSPP	02-186592*	
A4G	1/2" BSPP	30706	
A6G	3/4" BSPP	30708	
A10H	SAE 10	30707	
A12H	SAE 12	30709	
S4G	1/2" BSPP		02-175143
S6G	3/4" BSPP		02-175144
S10T	SAE 10		02-175141
S12T	SAE 12		02-175142
		·	

See section J for housing details.

Torque cartridge in aluminum housing to 108–122 Nm

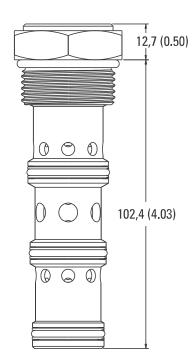
(80-90 ft lbs)

Dimensions

mm (inch)

FDC11-16

Cartridge only Basic code



5 Flow divisions (Ratios)

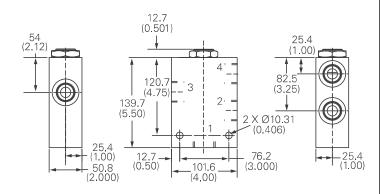
Code	Flow division %		Rated inlet flow	
	Port 4	Port 2	L/min	(USgpm)
66	50	50	133,0	(35)
44	50	50	114,0	(30)
33	50	50	083,6	(22)
22	50	50	057,0	(15)
64	60	40	140,6	(37)
45	40	60	140,6	(37)
62	75	25	114,0	(30)
26	25	75	114,0	(30)
42	67	33	83,6	(22)
24	33	67	83,6	(22)

6 Special features

00 - None

(Only required if valve has special features, omitted if "00".)

Installation drawing



Notes: Port 1, unused, blocked by blind cavity.

Minimum inlet flow should not be less than 1/4 of maximum inlet flow for a given code.

Up to 40 L/min (10.5 USgpm) • 350 bar (5000 psi)

Operation

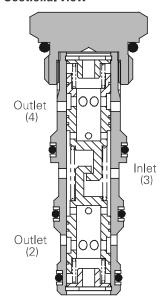
Inlet flow passes through the two matched orifices in the spools, through the spools and out of the radial holes in the sleeve. The matched orifices and the compensating springs ensure that the flow is divided equally, excess flow in

either direction causes the spool to move and close the radial holes in the sleeve until equilibrium is restored. In the reverse direction the spools close together and regulate the flow in through the radial ports.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions. Cartridge construction gives versatility of application. A valve may be fitted into a line body, a custom designed Hydraulic Integrated Circuit or other hydraulic equipment.

Sectional view



Performance data

Ratings and specifications

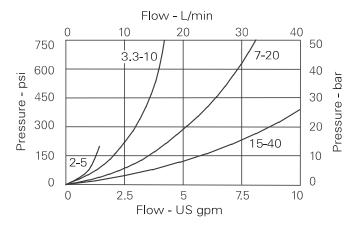
Figures based on oil temp at 40° and viscosity at 40 cSt		
Rated flow	Up to 40 L/min (10.5 USgpm)	
Max pressure	350 bar (5000 psi)	
Cartridge material	All working parts hardened and ground steel. Zinc plated external steel body	
Body material	Standard aluminum (up to 210 bar*) add suffix "377" for steel option	
Mounting position	Unrestricted	
Cavity number	A12744 (See Section M)	
Torque cartridge into cavity	34 Nm (25 lbs ft)	
Weight	2CFD50 0.10 kg (0.23 lbs) 2CFD55 0.44 kg (0.98 lbs)	
Seal kit	SK1065 (Nitrile) SK1065V (Viton®)	
Recommended filtration level	Up to 40 L/min (10.5 USgpm)	
Operating temp	-30° to +90°C (-22° to +194°F)	
Nominal range	50 to 500 cSt	

Viton is a registered trademark of E.I. DuPont

Description

This range of flow divider/ combiner valves gives division of input flow into two equal parts and re-combination of flow in the reverse direction. Pressure compensation ensures that whether dividing or combining, equal flow is maintained over a wide range of pressure variation. A typical use of these valves is to divide a pump flow to operate two actuators (which may be under different load conditions and at different pressures) and to re-combine the return flows to synchronize actuator movement. Flow variation is within ±10% with the maximum variation of pressure and inlet flow and under normal conditions will be significantly less.

Pressure drop



Note: When used on cylinders size to suit the return flow rate.

2CFD50 - Cartridge only **2CFD55** - Cartridge and body

2 Port size

Code	Port size	Housing number - body of	
		Aluminium	Steel
Omit	Cartridge only		
3W	3/8" BSP inlet and outlet	B19187	
4W	1/2" BSP inlet and outlet	B20816	
8T-6T	1/2" SAE inlet and 3/8" SAE outlet	B19185	B21935
See sect	ion J for housing details.		

3 Capacity (Input)

5 - 2-5 L/min (0.5-1.3 USgpm)

10 - 3.3 - 10 L/min (0.9-2.6 USgpm)

20 - 7-20 L/min (1.8-5.3 USgpm)

40 - 15-40 L/min (4.0-10.5 USgpm)

Other terminations available on request.

4 Seals

S - Nitrile (for use with most industrial hydraulic oils)

SV - Viton (for high temperature & most special fluid applications)

Dimensions

mm (inch)

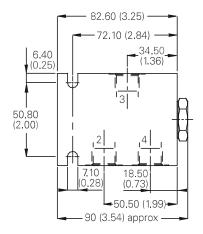
Cartridge only

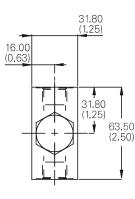
Basic code 2CFD50

7.50 (0.30) 25.4 A/F 7/8"-14-UNF-2A

Complete valve

3/8", 1/2" Ports Basic code 2CFD55





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Notes: For applications above 210 bar (3000 psi), please consult our technical department or use the steel body option.

Notes: Blocking one leg will result in a large reduction in flow from the other. Valves with higher working pressures are available. Contact main office for details.

H-119

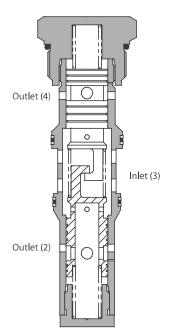
Inlet flow passes through the two matched orifices in the spools, through the spools and out of the radial holes in the sleeve. The matched orifices and the compensating springs ensure that the flow is divided equally, excess flow

in either direction causes the spool to move and close the radial holes in the sleeve until equilibrium is restored. In the reverse direction the spools close together and regulate the flow in through the radial ports.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions. Cartridge construction gives versatility of application. A valve may be fitted into a line body, a custom designed Hydraulic Integrated Circuit or other hydraulic equipment.

Sectional view



Performance data

Ratings and specifications

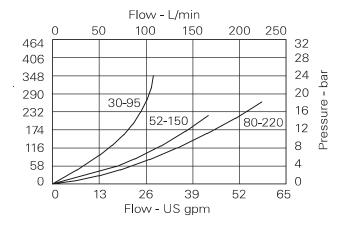
Figures based on an oil temp at 40°C and of 32 cSt (1	50 SUS)
Rated Flow	Up to 220 liters/min (58 USgpm)
Ratio division	50/50 standard
Maximum pressure	280 bar (4000 psi)
Cartridge material	Working parts hardened & ground steel. Zinc plated external steel body
Body material	Aluminum (up to 210 bar*) Add suffix "377" for steel option
Mounting position	Unrestricted
Cavity Number	CVB-42-04-0 (See Section M)
Torque cartridge into cavity	150 Nm (110 ft lbs)
Weight	2CFD200: 0,78 kg (1.72 lbs) 2CFD250: 2,50 kg (5.50 lbs)
Seal kit number	SK597 (Nitrile), SK597V (Viton®)
Recommended Filtration Level	BS5540/4 Class 18/13
Temperature range	-30° to +90° C (-22° to 194° F)
Nominal range	5 to 500 cSt

Viton is a registered trademark of E.I. DuPont

Description

This range of flow divider/ combiner valves gives division of input flow into two equal parts and re-combination of flow in the reverse direction. Pressure compensation ensures that whether dividing or combining, equal flow is maintained over a wide range of pressure variation. A typical use of these valves is to divide a pump flow to operate two actuators (which may be under different load conditions and at different pressures) and to re-combine the return flows to synchronize actuator movement. Flow variation is within ±10% with the maximum variation of pressure and inlet flow and under normal conditions will be significantly less.

Pressure drop



Note: When used on cylinders, size to suit the return flow rate.

2CFD200 - Cartridge only **2CFD250** - Cartridge & body

2 Port size

Code	Port size	Housing number - body or	
		Aluminium	Steel
Omit	Cartridge only		
8W-6W	1" BSP inlet, 3/4" BSP outlet	C12320	
10W-8W	1 1/4" BSP inlet, 1" BSP outlet	B7666	B9075
16T-12T	1" SAE inlet and 3/4" SAE outlet	B10710	
20T-16T	1-1/4" SAE inlet and 1" SAE outlet	B10711	B11819
See sectio	n J for housing details.		

3 Capacity (input)

95 - 30-95 L/min (7.9-25 USgpm)

150 - 52-150 L/min (13.7-40 USgpm)

220 - 80-220 L/min (21-58 USgpm)

4 Seals

S - Nitrile (for use with most industrial hydraulic oils)

SV - Viton (for high temperature & most special fluid applications)

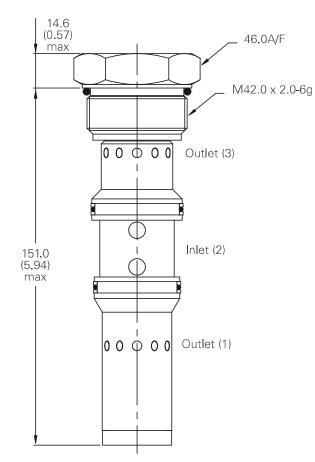
Н

Dimensions

mm (inch)

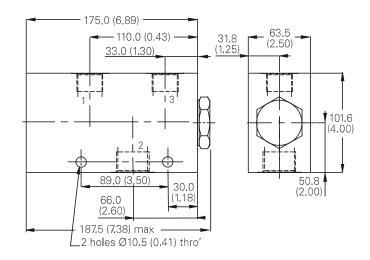
Cartridge only

Basic code 2CFD200



Complete valve

3/4", 1", 1 1/4" Ports Basic code 2CFD250



Note: Blocking one leg will result in a large reduction in flow from the other. Valves with higher working pressures are available. Contact factory for details. **Note:** For applications above 210 bar (3000 psi)please consult our technical department or use the steel body option

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

H-121

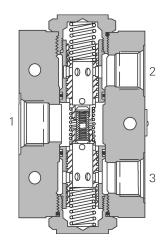
Inlet flow passes through the two matched orifices in the spools, through the spools and out of the radial holes in the sleeve. The matched orifices and the compensating springs ensure that the flow is divided equally, excess flow in either

direction causes the spool to move and close the radial holes in the sleeve until equilibrium is restored. In the reverse direction the spools close together and regulate the flow in through the radial ports.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions.

Sectional view



Performance data

Ratings and specifications

Performance data is typical with fluid at 21,8 cST (105 SUS)	and 49°C (120°F)
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated inlet flow	See model code
Fluids	All general purpose hydraulic fluids such as MIL–H–5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ 16/13
Standard housing materials	Aluminum
Weight cartridge only	2,6 kg. (5.75 lbs)
Seal kits	889639 (Buna—N) 889643 (Viton®)

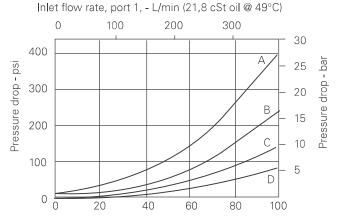
Viton is a registered trademark of E.I. DuPont

Description

This range of flow divider/ combiner valves gives division of input flow into two equal parts and re-combination of flow in the reverse direction. Pressure compensation ensures that whether dividing or combining, equal flow is maintained over a wide range of pressure variation. A typical use of these valves is to divide a pump flow to operate two actuators (which may be under different load conditions and at different pressures) and to re-combine the return flows to synchronize actuator movement. Flow variation is within ±10% with the maximum variation of pressure and inlet flow and under normal conditions will be significantly less.

Pressure drop

Cartridge only



Inlet flow rate, port 1, - USgpm (105 SUS oil @ 120°F)

Flow division

(See model code position 5)

A - 3* spool **C** - 6* spool **B** - 4* spool **D** - 8* spool

FDC1-20 - Flow divider/combiner

Line mounted, pressure compensated, spool type Up to 378 L/min (100 USgpm) • 210 bar (3000 psi)

Model code

FDC1 - 20 (V) - *** - ** - 00

1 Function

FDC1 - Flow divider/combiner

2 Size

20 - 20 size

3 Seals

Blank - Buna-N **V** - Viton®

4 Port Size

16T - SAE 16 (light duty) **20T** - SAE 20 (light duty)

(Available as a complete assembly only.)

5 Flow divisions (Ratios)

Code	Flow d	ivision %	Max	Inlet flow
	Port 4	Port 2	L/min	(USgpm)
33	50	50	190	50
34	43	57	228	60
36	33	67	265	70
44	50	50	265	70
66	50	50	379	100
88	50	50	379	100

6 Special features

00 - None

(Only required if valve has special features, omitted if "00".)

Dimensions

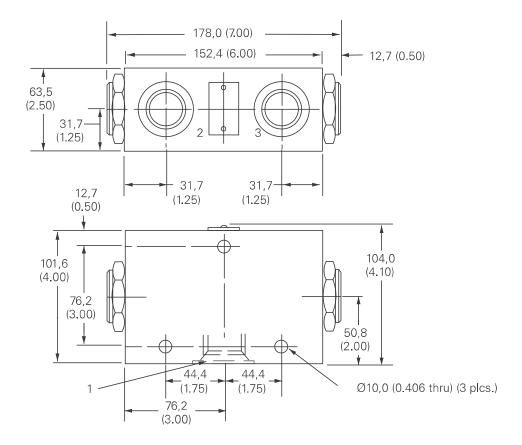
mm (inch)

Complete valve

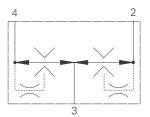
Basic code FDC1-20

Torque cartridge in housing to 128–155 Nm (95–115 ft lbs)

Notes: Minimum inlet flow should not be less than 1/4 of maximum inlet flow for a given code.



H-123

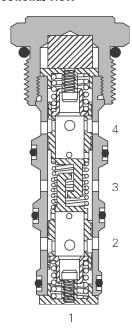


This valve is used in the dividing mode. It will take the inlet flow (port 3) and split the flow to ports 2 and 4. In the combining mode this valve will take the inlet flows from ports 2 and 4 and combine them into port 3 according to the ratio specified.

Features

Hardened and ground and honed working components. Cartridge construction for maximum mounting flexibility.

Sectional view



Performance data

Ratings and specifications

Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)	
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated inlet flow	See model code, item
Temperature range	-40° to 120° C (-40° to 248° F)
Fluids	All general purpose hydraulic fluids such as: MIL–H–5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ 16/13
Standard housing materials	Aluminum
Weight cartridge only	0,35 kg. (0.78 lbs)
Seal kits	889634 (Nitrile) 889638 (Viton®)

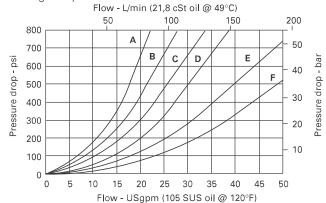
Viton is a registered trademark of E.I. DuPont

Description

This is a pressure compensated flow divider / combiner posi-traction screw in cartridge valve. This is ideal for use in transmission systems where the turning circle requires one wheel to go faster than the other or where rapid make up is required between cylinders at the end of stroke.

Pressure drop

Cartridge only



Flow division

(See model code position 5)

 A - 22 spool
 D - 55 spool

 B - 33 spool
 E - 66 spool

 C - 44 spool
 F - 88 spool

FDC3 - Posi-traction valve

3 Seals
Blank - Buna-N
V - Viton®

2 Size

16 - 16 size

4 Port size

Code	Port size	Housing number	
		Aluminium	
0	Cartridge only		
12T	SAE 12	566200	
6B	3/4" BSPP	02-175468	
See section	ı J for housing details.		

5 Flow divisions

Code	Flow division %		Max	Inlet flow
	Port 4	Port 2	L/min	(USgpm)
22	50	50	57,0	(15)
33	50	50	76,0	(20)
44	50	50	106,4	(28)
55	50	50	126,2	(34)
66	50	50	152,0	(40)
88	50	50	228,0	(60)

6 Special features

00 - None

(Only required if valve has special features, omitted if "00".)

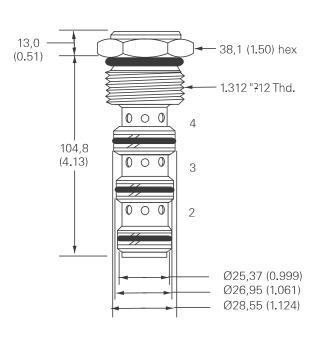
Dimensions

mm (inch)

Torque cartridge in aluminum housing to 108–122 Nm (80–90 ft lbs)

Cartridge only Basic code

FDC3-16



Notes: Port 1, unused, blocked by blind cavity.

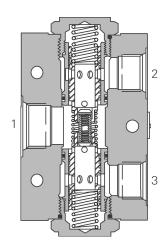
Minimum inlet flow should not be less than 1/4 of maximum inlet flow for a given code.

This valve is used in the dividing mode. It will take the inlet flow (port 3) and split the flow to ports 2 and 4. In the combining mode this valve will take the inlet flows from ports 2 and 4 and combine them into port 3 according to the ratio specified.

Features

One valve synchronizes in both directions. Matched spools give high accuracy under load and pressure imbalance conditions.

Sectional view



Performance data

Ratings and specifications

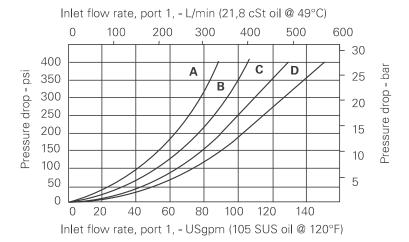
Performance data is typical with fluid at 21,8 cST (105 SUS) and 49°C (120°F)	
Typical application pressure (all ports)	210 bar (3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated inlet flow	See model code, item
Temperature range	-40° to 120° C (-40° to 248° F)
Fluids	All general purpose hydraulic fluids such as MIL–H–5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18/ 16/13
Standard housing materials	Aluminum
Weight cartridge only	0,35 kg. (0.78 lbs)
Seal kits	889634 (Nitrile) 889638 (Viton®)

Viton is a registered trademark of E.I. DuPont

Description

This is a pressure compensated flow divider / combiner posi-traction valve. This is ideal for use in transmission systems where the turning circle requires one wheel to go faster than the other or where rapid make up is required between cylinders at the end of stroke.

Pressure drop



Flow division

(See model code position 5)

C - 66 spool **D** - 88 spool

A - 33 spool

spool D-88

B - 44 spool

FDC3-20 - Flow divider/combiner

Pressure compensated, spool type, posi-traction Up to 570 L/min (150 USgpm) • 210 bar (3000 psi)

Model code

FDC3 - 20 (V) - *** - ** - 00

1 Function

FDC3 - Posi-traction valve

2 Size

20 - 20 size

3 Seal material

Blank - Buna-N **V** - Viton®

4 Port size

16T – SAE 16 (light duty) **20T** – SAE 20 (light duty) (Available as a complete assembly only.)

5 Flow divisions (Ratios)

Code	Flow division %		Rated	Inlet flow
	Port 4	Port 2	L/min	(USgpm)
33	50	50	190,0	(50)
44	50	50	266,0	(70)
66	50	50	380,0	(100)
88	50	50	570,0	(150)

6 Special features

00 - None

(Only required if valve has special features, omitted if "00".)

Dimensions

mm (inch)

Complete valve

Basic code FDC3-20

Torque cartridge in housing to 128–155 Nm (95–115 ft lbs)

Note: Minimum inlet flow should not be less than 1/4 of maximum inlet flow for a given code.

