

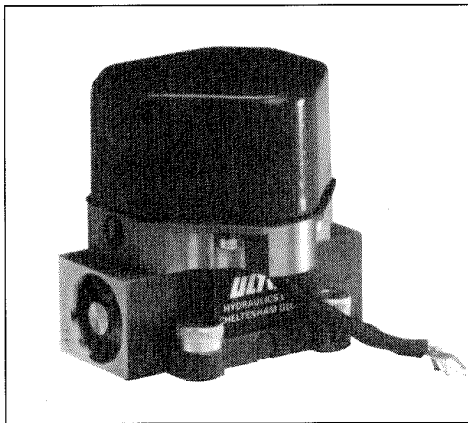
ULTRA MINIATURE RANGE

Series 4633 and 4653

Ultra Miniature range of valves are two stage nozzle flapper pilot stage, dry torque motor units incorporating an internal filter to afford additional protection to precision first stage components. The second stage consists of a hardened stainless steel spool which slides directly in a hardened stainless steel body.

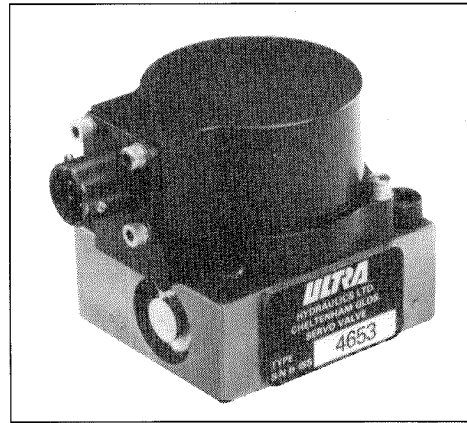
Nominal rated flows:- 1 to 20 l/min at 70 bar (.26 to 5.28 US.GPM at 1015 psi) pressure drop.

4633



4633 Series Sub Miniature valves are ideally suited to industrial and robot applications where an extremely small, light weight precision unit is required.

4653

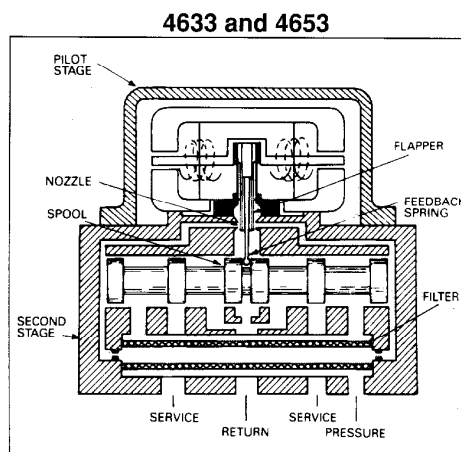


4653 Series Miniature valves are suitable for applications where space is limited, such as robots, machine tools and miniature mechanisms.

MINIATURE RANGE - TECHNICAL SPECIFICATION

RATED FLOW 4633			
Nominal rated flow at 70 bar (1015 psi) ΔP		Null Leakage at 140 bar (2030 psi) supply	
l/min	US.GPM	l/min	US.GPM
1	0.26	0,6	0.16
2	0.53	0,6	0.16
3	0.79	0,6	0.16
4	1.05	0,7	0.18
5	1.32	0,7	0.18
6	1.58	0,7	0.18

RATED FLOW 4653			
Nominal rated flow at 70 bar (1015 psi) ΔP		Null Leakage at 140 bar (2030 psi) supply	
l/min	US.GPM	l/min	US.GPM
2	0.53	0,6	0.16
5	1.32	0,9	0.24
10	2.64	1,2	0.32
15	3.96	1,4	0.37
20	5.28	1,6	0.42



COIL RATINGS 4633 and 4653	
Differential signal	Resistance per coil
10 mA	1000 Ohm
15 mA	200 Ohm
15 mA	350 Ohm
40 mA	80 Ohm
80 mA	22 Ohm
200 mA	22 Ohm
60 mA	40 Ohm

Special coils and flow ratings are available
- please Consult the Sales Department.

Intrinsically Safe versions are available,
see Installation Data and Ordering Codes.

MINIATURE RANGE - TECHNICAL SPECIFICATION

Supply pressure bar (psi) **4633, 4653**

Minimum required to effect spool movement	3,5 (51)
Minimum recommended	15 (217)
Maximum continuous	280 (4060)

Proof pressure

At pressure port	150% max supply pressure
At return port	100% max supply pressure

Burst pressure

Return port open	250% max supply pressure
------------------	--------------------------

External leakage

Zero

Fluid

Industrial petroleum based hydraulic fluid. Other fluids can be considered - consult Sales Department

System filtration

NAS 1638 class 7. ISO 4406
Code 16/13 or better

Seal material

High nitrile standard. Viton and other materials supplied on request.

Operating temperature

-30° to +120° C (-22° F to + 248° F)

Null setting

Optional external null adjust

Mass

4633	0,2 Kg (0.44 lbs)
4653	0,5 Kg (1.1 lbs)

Hysteresis

Less than 3% without dither

Threshold

Less than 1% without dither

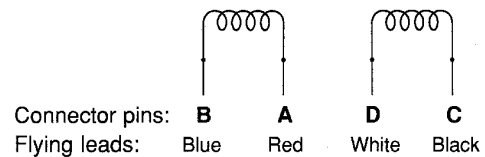
Null shift

The servo valve null setting is liable to change under certain environmental and operational conditions:

		NULL SHIFT
Temperature	40° C (104° F) change	< 2%
Supply pressure	80% to 110%	< 2%
Back pressure	0 to 20% of supply pressure	< 2%

Coil Schematic

4633



Valve polarity:

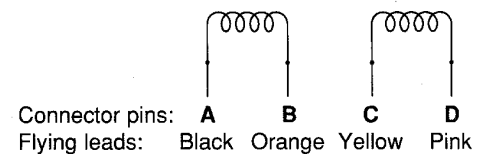
Flow from port 2 will result with:

SERIES: B+ (positive), A and D linked,
C - (negative).

PARALLEL: B + (positive), A - (negative),
D + (positive), C - (negative).

Coil Schematic

4653



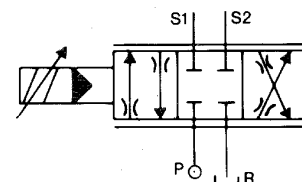
Valve polarity:

Flow from port 2 will result with:

SERIES: A + (positive), B and C linked,
D - (negative).

PARALLEL: A + (positive), B - (negative),
C + (positive), D - (negative).

Functional Symbol



PERFORMANCE DATA - 4633 SERIES VALVE

Figure 1 Flow Characteristics

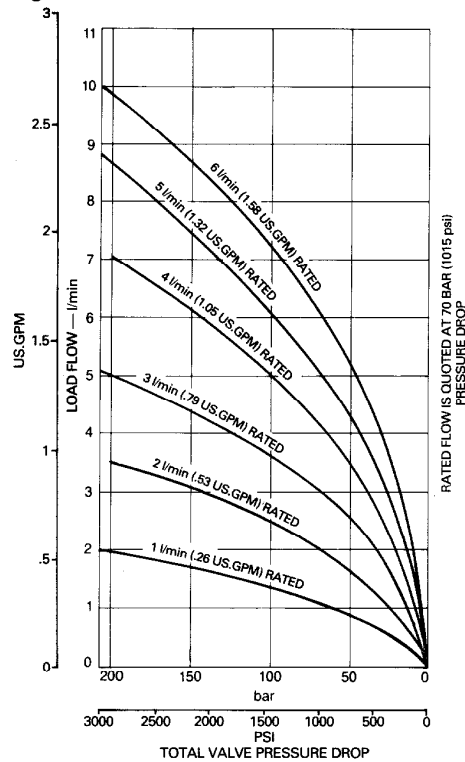


Figure 2 Typical Flow Gain

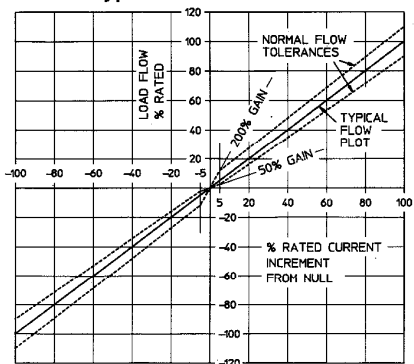


Figure 3 Transient Response

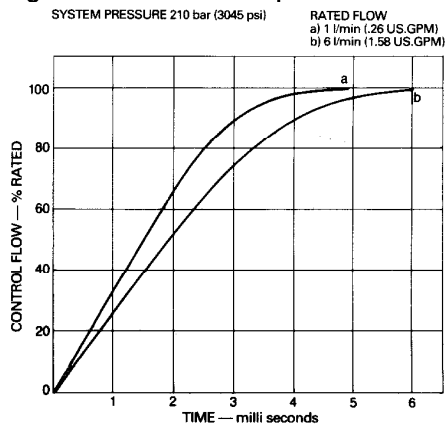


Figure 4 Dynamic Response

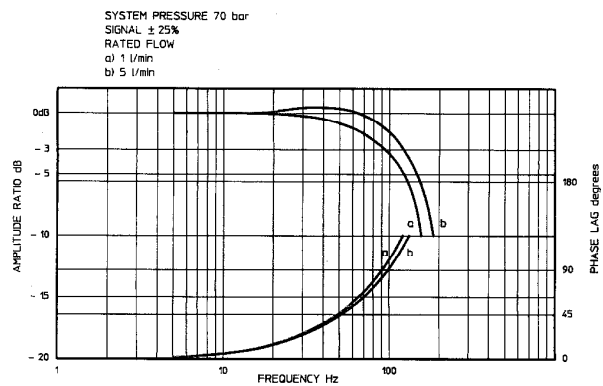


Figure 5

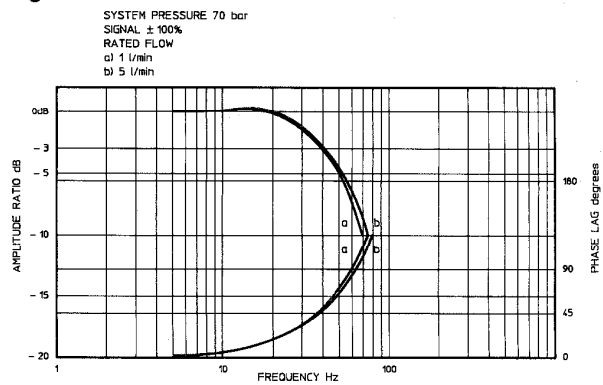


Figure 6

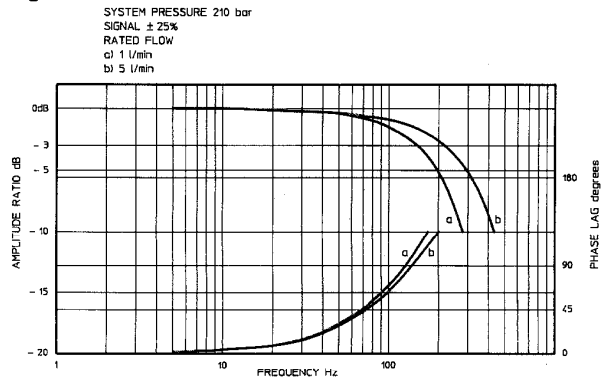
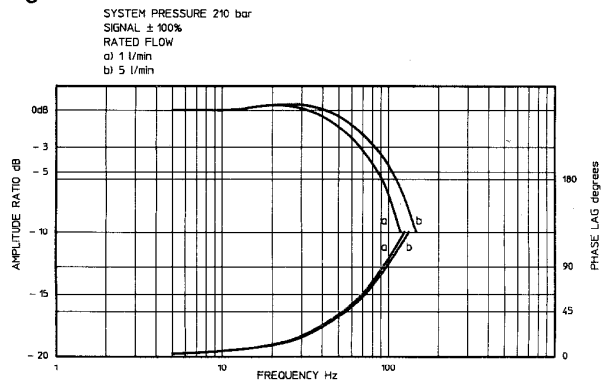


Figure 7



PERFORMANCE DATA - 4653 SERIES VALVE

Figure 1 Flow Characteristics

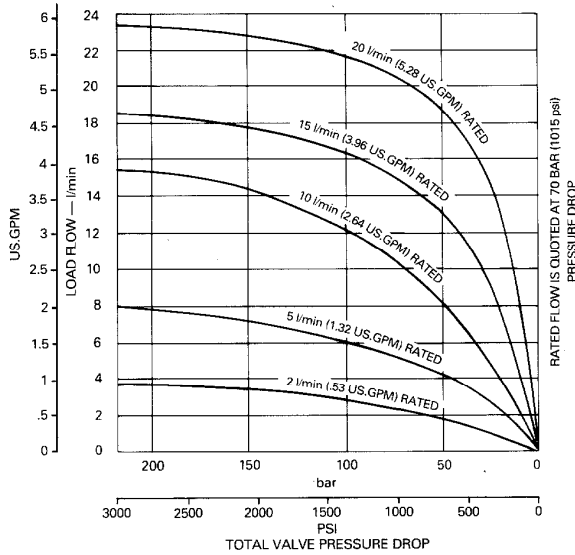


Figure 2 Typical Flow Gain

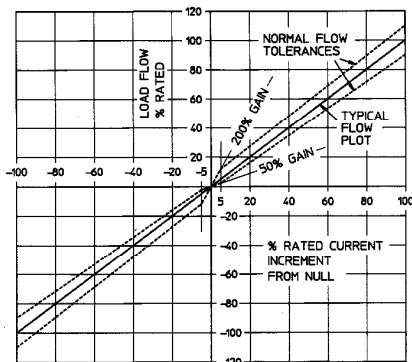


Figure 3 Transient Response

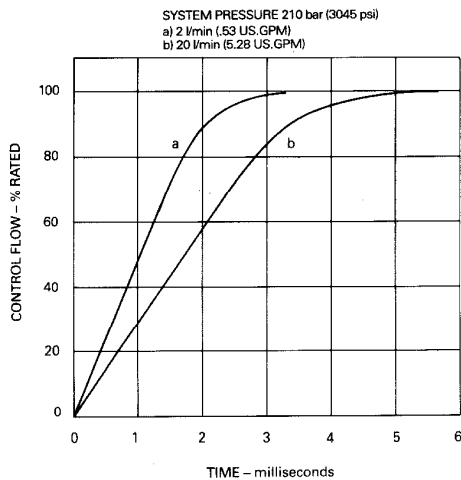


Figure 4 Dynamic Response

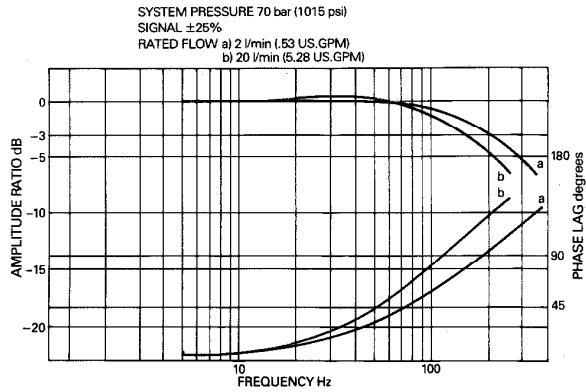


Figure 5

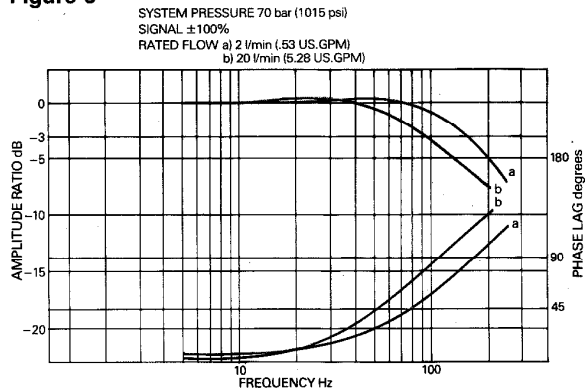


Figure 6

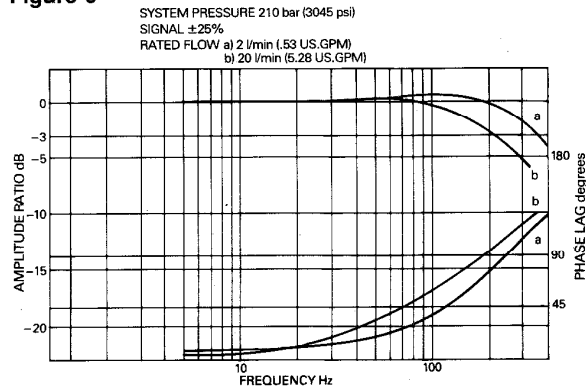
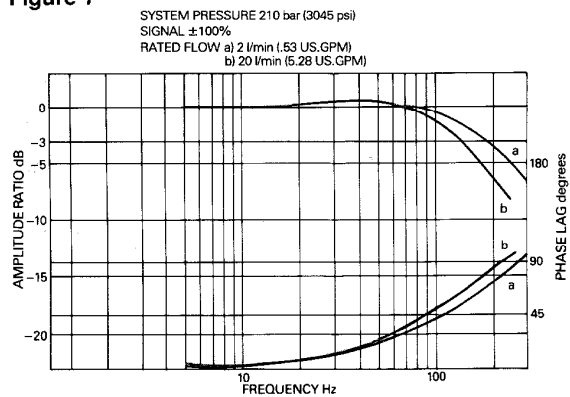


Figure 7



MINIATURE RANGE - ORDERING CODE

SERVO VALVE PART No

4633

4653 - X X X - X X X

1st TO 4th Digits SERIES

NOTE : 2nd Digit 8 denotes Intrinsically Safe eg. 4833, 4853.

5th Digit ELECTRICAL CONNECTOR

	4633	4833	Conn' Position	4653	4853
1	Flying Lead (600 mm)	_____	Press' Side	Flying Lead (600 mm)	_____
2	Lemo Type (4 Pin)	Lemo Type (4 Pin)	Press' Side	Thorn Pygmy	Thorn Pygmy
3	Flying Lead and Magnetic Null Adjust	_____	Press' Side	Flying Lead and Magnetic Null Adjust	_____
4	Lemo Type (4 Pin) & Magnetic Null Adjust	_____	Press' Side	Thorn Pygmy and Magnetic Null Adjust	Thorn Pygmy and Magnetic Null Adjust
5	Flying Lead (600 mm)	_____	Return Side	Flying Lead(700mm) (Short connector)	_____
6	Lemo Type (4 Pin)	Lemo Type (4 Pin)	Return Side	Flying Lead(700mm) (Short connector magnetic null adjust)	_____
7	Flying Lead and Magnetic Null Adjust	_____	Return Side	_____	_____
8	Lemo Type (4 Pin) & Magnetic Null Adjust	_____	Return Side	_____	_____
9	Non Standard			Non Standard	

6th Digit VALVE SIGNAL

	4633	4653	4833	4853	
	Differential rated current (milliamps)	Resistance per coil (ohms)	Differential rated current (milliamps)	Resistance per coil (ohms)	IS. Approval authority
1	10	1000	10	1000	Baseefa
2	15 *	200	15	200	Baseefa
3	15	350	10	1000	F.M.
4	40	80	15	200	F.M.
5	80	22	—	—	—
6	200	22	—	—	—
8	60	40	—	—	—
9	Non standard		—	—	—

* Non Preferred Coil Option:

7th Digit RATED FLOW

	4633	4833	4653	4853
	l/min at 70 bar Δ P (US.GPM. at 1015 PSI)		l/min at 70 bar Δ P (US.GPM. at 1015 PSI)	
1	1	(.26)	2	(.53)
2	2	(.53)	5	(1.32)
3	3	(.79)	10	(2.64)
4	4	(1.05)	15	(3.96)
5	5	(1.32)	20	(5.28)
6	6	(1.58)	—	—
9	Non Standard		Non Standard	

8th, 9th & 10th Digits DESIGN CODE

	4633	4653	4833	4853
000	Internal Pilot			
9**	Special numbers allocated by design office to denote valve with non standard features			

SPECIAL FLOW AND COIL OPTIONS AVAILABLE ON REQUEST CONSULT ULTRA SALES OFFICE