HOW TO ORDER
ISO5599/2 VALVE MANIFOLD

VV8 2 5 - 03 - TU1 [ ] 03 D T - W1

W1=NEMA 4

ISO Size

1	Size 1
2	Size 2
3	Size 3

Port Thread Code

NIL	Rc (PT)
T	NPTF
F	G(PF)

Number of Stations

2	2 stations
9	9 stations

Location of port 1(P), 5(EA), 3(EB)

D	D side
U	U side
B	Both side

Size of port 1(P), 5(EA), 3(EB)

Symbol	Size	Applicable ISO size
02	1/4	Size 1
03	3/8	Size 1, 2
04	1/2	Size 1, 2
06	3/4	Size 2, 3
10	1	Size 3

U side option

SU0	No option
SUQW	DeviceNet serial interface (Note)
TU1	Terminal Box

Note: Please ask available protocol to SMC

Conduit Port Thread (for terminal box only)

Symbol	Port Thread
NIL	Rc (PT)
F	G (PF)
N	NPT
T	NPTF

Locations and sizes of port 4(A), 2(B)

Symbol	Port location	Applicable ISO size
02	Side 1/4	Size 1
03	Side 3/8	Size 1, 2
04	Side 1/2	Size 1, 2, 3
06	Side 3/4	Size 2, 3
10	Side 1	Size 3
02B	Bottom and side 1/4 with plug on side	Size 1
03B	Bottom and side 3/8 with plug on side	Size 1, 2
04B	Bottom and side1/2 with plug on side	Size 2, 3
06B	Bottom and side 3/4 with plug on side	Size 3
02S	Side and bottom 1/4 with plug on bottom	Size 1
03S	Side and bottom 3/8 with plug on bottom	Size 1, 2
04S	Side and bottom 1/2 with plug on bottom	Size 2, 3
06S	Side and bottom 3/4 with plug on bottom	Size 3

SERIAL INTERFACE MANIFOLD BLOCK ASS'Y

MBS8 080 - SU - 1W

ISO Size

060	Size 1
080	Size 2
100	Size 3

Location of SI

SU	U side manifold block ass'y

HOW TO ORDER
LATERAL PLUG-IN MANIFOLD BLOCKS

VALVE MANIFOLD BLOCKS

MBS 8080 - 04B T - 1W - XG

OPTIONS	
NIL	
XG	ISO 1179-1 THREAD SPEC

1W=NEMA 4

ISO SIZE	
8060	ISO 1
8080	ISO 2
8100	ISO 3

PORT THREAD	
NIL	Rc(PT)
T	NPTF
F	G(PF)

CODE	A, B, PORT SIZE / LOCATION	APPLICABLE ISO SIZE	NOTES
02	1/4" SIDE ONLY	1	NO PORTS ON BOTTOM OF MANIFOLD
03	3/8" SIDE ONLY	1, 2	
04	1/2" SIDE ONLY	1, 2, 3	
06	3/4" SIDE ONLY	2, 3	
10	1" SIDE	3	
02B	1/4" BOTTOM	1	SIDE PORTS PLUGGED
03B	3/8" BOTTOM	1, 2	
04B	1/2" BOTTOM	2, 3	
06B	3/4" BOTTOM	3	
02S	1/4" SIDE	1	BOTTOM PORTS PLUGGED
03S	3/8 SIDE	1, 2	
04S	1/2" SIDE	2, 3	
06S	3/4" SIDE	3	

NOTE: Device Net Serial Interface Module Manifold Block **MBS 8080 - SU - 1W**

Device Net Serial Interface Module **EX230 - SDN1**

HOW TO ORDER
LATERAL PLUG-IN MANIFOLD END PLATES

MES 808 D - 04 T - 1W

1W=NEMA 4

ISO SIZE	
806	ISO 1
808	ISO 2
810	ISO 3

MANIFOLD END	
D	Downstream
U	Upstream

PORT THREAD	
NIL	Rc(PT)
T	NPTF
F	G(PF)

PORT SIZE		APPLICABLE ISO SIZE
02	1/4	Size 1
03	3/8	Size 1, 2
04	1/2	Size 1, 2
06	3/4	Size 2, 3
10	1	Size 3

NOTE: When ordering parts for assembly. (2) AXT502-34-"*" (use"*" for number of stations) tie rods must be ordered separately for size 1 only. If only connecting size 1 end plates to manifold. (2) AXT502-4-2 must be ordered separately.

HOW TO ORDER
MANIFOLD ASSEMBLIES FOR (4-PIN EURO CONNECTOR) PLUG-IN VALVE BASES

VV8 [1] [5] - [03S] - [W] [03] [D] [T] - [X6]

4-PIN EURO CONNECTOR
X6
X13
X17
X53

* For wiring options, please refer to page 13 for more information.

ISO SIZE	
1	ISO 1
2	ISO 2
3	ISO 3

PORT THREAD	
NIL	Rc(PT)
T	NPTF
F	G(PF)

NUMBER OF STATIONS	
2	2 STATIONS
:	:
:	:
10	10 STATIONS

P, EXH. PORT LOCATION	
D	DOWN STREAM
U	UP STREAM
B	BOTH

CODE	A, B, PORT SIZE / LOCATION	APPLICABLE ISO SIZE
02	1/4" SIDE ONLY	1
03	3/8" SIDE ONLY	1, 2
04	1/2" SIDE ONLY	1, 2, 3
02B	1/4" BOTTOM	2, 3
03B	3/8" BOTTOM	1, 2
02S	1/4" SIDE	1
03S	3/8 SIDE	1, 2

NOTES

NO PORTS ON BOTTOM OF MANIFOLD

SIDE PORTS PLUGGED

BOTTOM PORTS PLUGGED

P, EXH. PORT SIZE		APPLICABLE ISO SIZE
02	1/4"	1
03	3/8"	1, 2
04	1/2"	1, 2, 3
06	3/4"	2, 3
10	1"	3

HOW TO ORDER
LATERAL PLUG-IN MANIFOLD BLOCKS WITH 4-PIN EURO CONNECTOR

VALVE MANIFOLD BLOCKS

MBS [8080] - [04B] [T] -[1W] - [X6]

4-PIN EURO CONNECTOR
X6
X13
X17
X53

* For wiring options, please refer to page 13 for more information.

ISO SIZE	
8060	ISO 1
8080	ISO 2

1W=NEMA 4

PORT THREAD	
NIL	Rc(PT)
T	NPTF
F	G(PF)

CODE	A,B, PORT SIZE / LOCATION	APPLICABLE ISO SIZE
02	1/4" SIDE ONLY	1
03	3/8" SIDE ONLY	1, 2
04	1/2" SIDE ONLY	1, 2, 3
02B	1/4" BOTTOM	1
03B	3/8" BOTTOM	1, 2
02S	1/4" SIDE	1
03S	3/8" SIDE	1, 2
04S	3/4" SIDE	2, 3

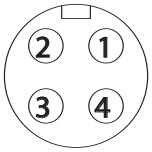
NOTES

NO PORTS ON BOTTOM OF MANIFOLD

SIDE PORTS PLUGGED

BOTTOM PORTS PLUGGED

WIRING INFORMATION



SUB-BASE

OPTION			OPTION		
X11	PIN 1	NOT USED	X53	PIN 1	14 (A) +
	PIN 2	12 (B) +		PIN 2	NOT USED
	PIN 3	COMMON		PIN 3	COMMON
	PIN 4	14 (A) +		PIN 4	12 (B) +
X6	PIN 1	NOT USED			
	PIN 2	14 (A) +			
	PIN 3	COMMON			
	PIN 4	12 (B) +			

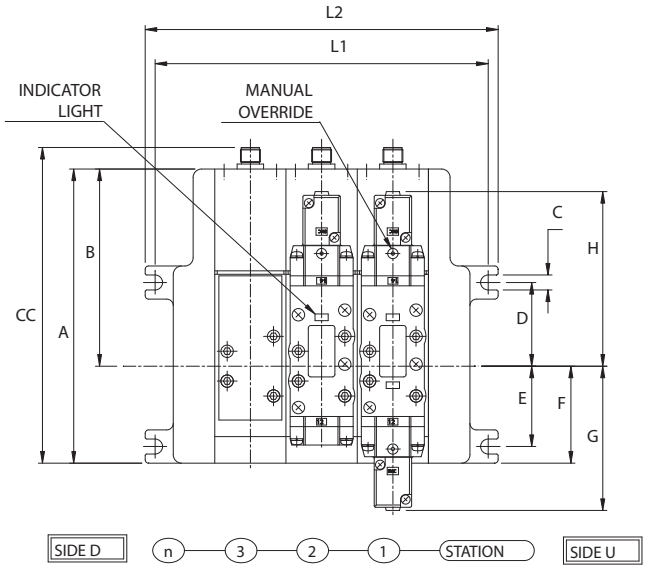
MANIFOLD BLOCK

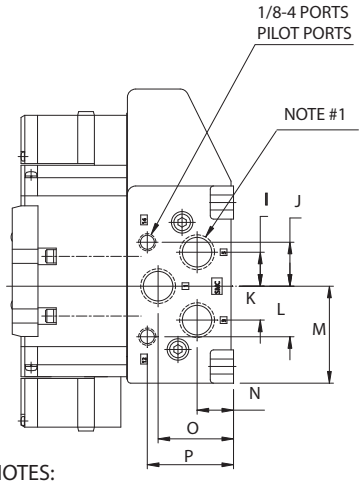
OPTION			OPTION		
X6	PIN 1	NOT USED	X13	PIN 1	NOT USED
	PIN 2	14 (A) +		PIN 2	12 (B) +
	PIN 3	COMMON		PIN 3	COMMON
	PIN 4	12 (B) +		PIN 4	14 (A) +
X17	PIN 1	NOT USED	X53	PIN 1	14 (A) +
	PIN 2	12 (B) +		PIN 2	NOT USED
	PIN 3	COMMON		PIN 3	COMMON
	PIN 4	14 (A) +		PIN 4	12 (B) +

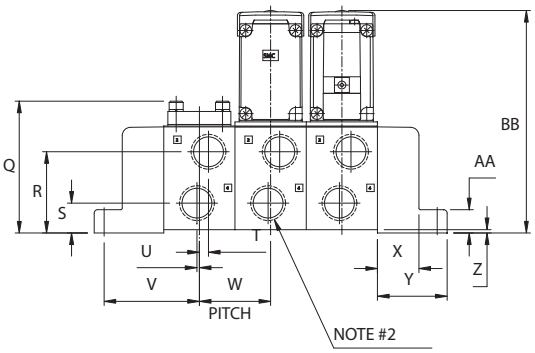
TERMINAL STRIP 22 POSITION

TERM P1=OUT 0
TERM P2=OUT 1
TERM P3=OUT 2
TERM P4=OUT 3
TERM P5=OUT 4
TERM P6=OUT 5
TERM P7=OUT 6
TERM P8=OUT 7
TERM P9=OUT 8
TERM P10=OUT 9
TERM P11=OUT 10
TERM P12=OUT 11
TERM P13=OUT 12
TERM P14=OUT 13
TERM P15=OUT 14
TERM P16=OUT 15
TERM P17=OV
TERM P18=OV
TERM P19=PE
TERM P20=ITV +24
TERM P21=ITV_IN0
TERM P22=ITV_IN1

MANIFOLD M12 CONNECTORS







NOTES:
1) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 3/4, 1
   6 PORTS, 1, 3, 5 PORTS
2) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 1/2, 3/4, 1
   2 PORTS, 2, 4 PORTS
3) ALL DIMENSIONS ARE IN MILLIMETERS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
SIZE 1	177.5	119	9	50.5	48.5	58.5	87	105	20.5	26.5	20.5	30.5	58.5	22	45.5	52	81	49	18	5.5
SIZE 2	189.5	125	9	52	52.5	64.5	96.5	112	26	34	26	37	64.5	31.5	58.5	67.5	97.5	58.5	20.5	3
SIZE 3	234.5	142.5	13	77.5	79.5	92	108	123.5	41	52	41	52	92	36	69	82.5	121	74	28	4

	U	V	W	X	Y	Z	AA	BB	CC
SIZE 1	1.5	57.5	43	25	42	2	14	133	188.5
SIZE 2	1	73	56	35	53	2	20	150.5	199
SIZE 3	4	68.5	71	30	45	2	20	175.5	244

n= NUMBER OF STATIONS (MIN. 2, MAX. 10)

LENGTH FORMULA
L1= 43n + 72
L2= 43n + 84

LENGTH DIMENSIONS — SIZE 1

L \ n	2	3	4	5	6	7	8	9	10
L1	158	201	244	287	330	373	416	459	502
L2	170	213	256	299	342	385	428	471	514

LENGTH FORMULA
L1= 56n + 90
L2= 56n + 106

LENGTH DIMENSIONS — SIZE 2

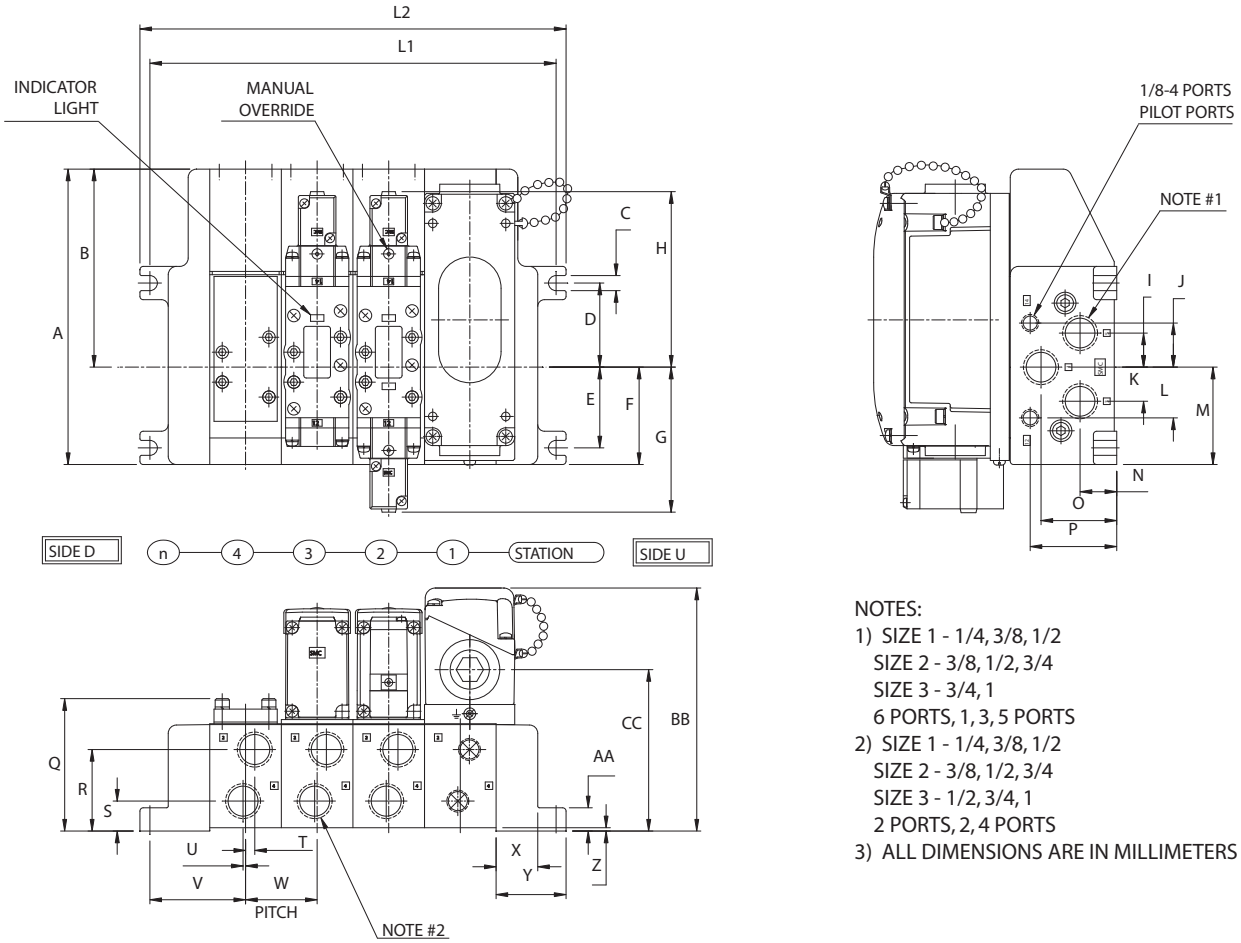
L \ n	2	3	4	5	6	7	8	9	10
L1	202	258	314	370	426	482	538	594	650
L2	218	274	330	386	442	498	554	610	666

LENGTH FORMULA
L1= 71n + 66
L2= 71n + 90

LENGTH DIMENSIONS — SIZE 3

L \ n	2	3	4	5	6	7	8	9	10
L1	208	279	350	421	492	563	634	705	776
L2	232	303	374	445	516	587	658	729	800

MANIFOLD WITH TERMINAL BOX



NOTES:
1) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 3/4, 1
   6 PORTS, 1, 3, 5 PORTS
2) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 1/2, 3/4, 1
   2 PORTS, 2, 4 PORTS
3) ALL DIMENSIONS ARE IN MILLIMETERS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
SIZE 1	177.5	119	9	50.5	48.5	58.5	87	105	20.5	26.5	20.5	30.5	58.5	22	45.5	52	81	49	18	5.5
SIZE 2	189.5	125	9	52	52.5	64.5	96.5	112	26	34	26	37	64.5	31.5	58.5	67.5	97.5	58.5	20.5	3
SIZE 3	234.5	142.5	13	77.5	79.5	92	108	123.5	41	52	41	52	92	36	69	82.5	121	74	28	4

	U	V	W	X	Y	Z	AA	BB	CC
SIZE 1	1.5	57.5	43	25	42	2	14	145.5	96.5
SIZE 2	1	73	56	35	53	2	20	159	110.5
SIZE 3	4	68.5	71	30	45	2	20	182.5	133.5

n= NUMBER OF STATIONS (MIN. 2, MAX. 10)

LENGTH FORMULA
L1= 43n + 72
L2= 43n + 84

LENGTH DIMENSIONS — SIZE 1

L \ n	2	3	4	5	6	7	8	9	10
L1	158	201	244	287	330	373	416	459	502
L2	170	213	256	299	342	385	428	471	514

LENGTH FORMULA
L1= 56n + 90
L2= 56n + 106

LENGTH DIMENSIONS — SIZE 2

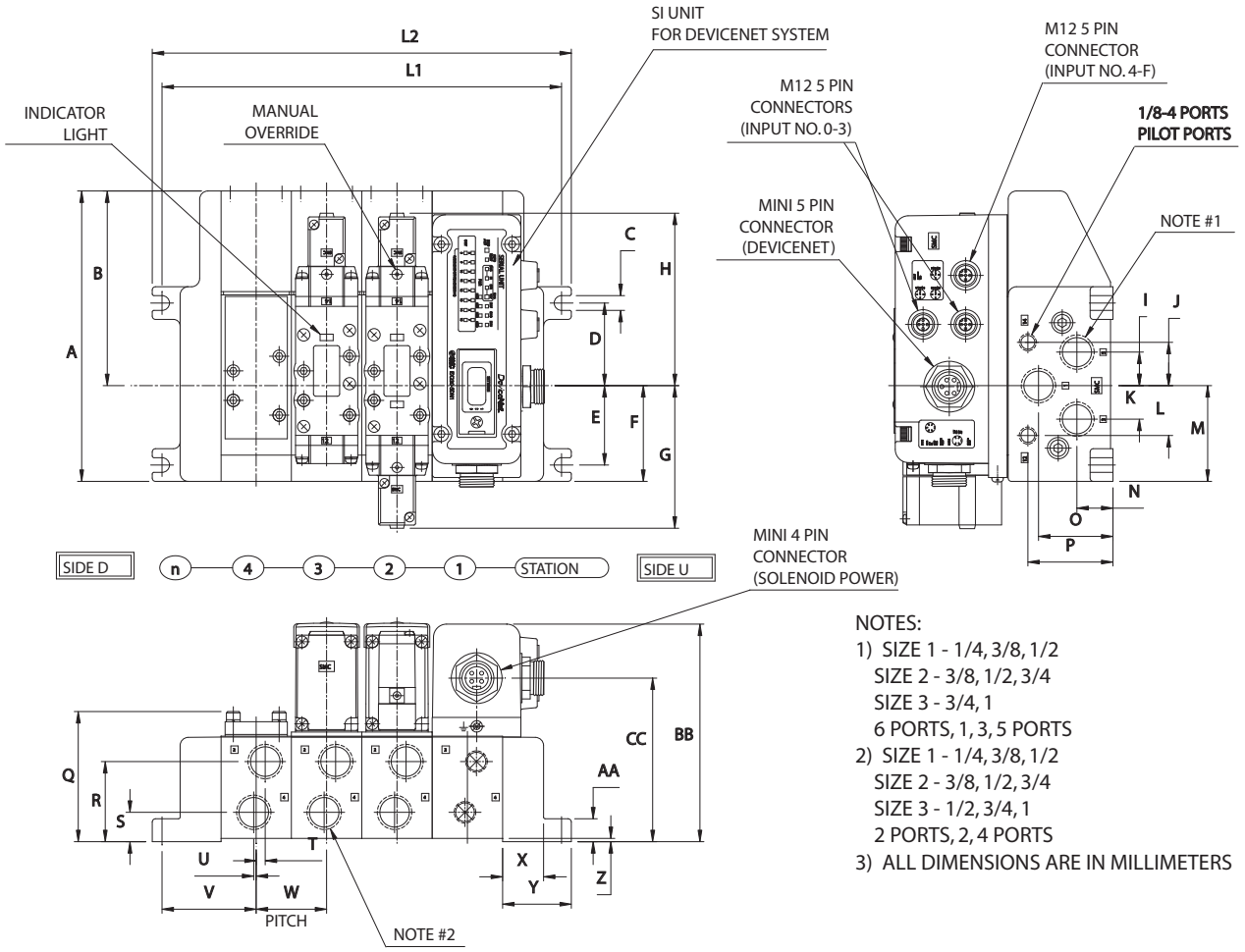
L \ n	2	3	4	5	6	7	8	9	10
L1	202	258	314	370	426	482	538	594	650
L2	218	274	330	386	442	498	554	610	666

LENGTH FORMULA
L1= 71n + 66
L2= 71n + 90

LENGTH DIMENSIONS — SIZE 3

L \ n	2	3	4	5	6	7	8	9	10
L1	208	279	350	421	492	563	634	705	776
L2	232	303	374	445	516	587	658	729	800

MANIFOLD DEVICENET



NOTES:
1) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 3/4, 1
   6 PORTS, 1, 3, 5 PORTS
2) SIZE 1 - 1/4, 3/8, 1/2
   SIZE 2 - 3/8, 1/2, 3/4
   SIZE 3 - 1/2, 3/4, 1
   2 PORTS, 2, 4 PORTS
3) ALL DIMENSIONS ARE IN MILLIMETERS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
SIZE 1	177.5	119	9	50.5	48.5	58.5	87	105	20.5	26.5	20.5	30.5	58.5	22	45.5	52	81	49	18	5.5
SIZE 2	189.5	125	9	52	52.5	64.5	96.5	112	26	34	26	37	64.5	31.5	58.5	67.5	97.5	58.5	20.5	3
SIZE 3	234.5	142.5	13	77.5	79.5	92	108	123.5	41	52	41	52	92	36	69	82.5	121	74	28	4

	U	V	W	X	Y	Z	AA	BB	CC
SIZE 1	1.5	57.5	43	25	42	2	14	132.5	99.5
SIZE 2	1	73	56	35	53	2	20	146.5	113.5
SIZE 3	4	68.5	71	30	45	2	20	168.5	135.5

n= NUMBER OF STATIONS (MIN. 2, MAX. 10)

LENGTH FORMULA
L1= 43n + 72
L2= 43n + 84

LENGTH DIMENSIONS — SIZE 1

L \ n	2	3	4	5	6	7	8	9	10
L1	158	201	244	287	330	373	416	459	502
L2	170	213	256	299	342	385	428	471	514

LENGTH FORMULA
L1= 56n + 90
L2= 56n + 106

LENGTH DIMENSIONS — SIZE 2

L \ n	2	3	4	5	6	7	8	9	10
L1	202	258	314	370	426	482	538	594	650
L2	218	274	330	386	442	498	554	610	666

LENGTH FORMULA
L1= 71n + 66
L2= 71n + 90

LENGTH DIMENSIONS — SIZE 3

L \ n	2	3	4	5	6	7	8	9	10
L1	208	279	350	421	492	563	634	705	776
L2	232	303	374	445	516	587	658	729	800

Precautions

Quality of Fluid

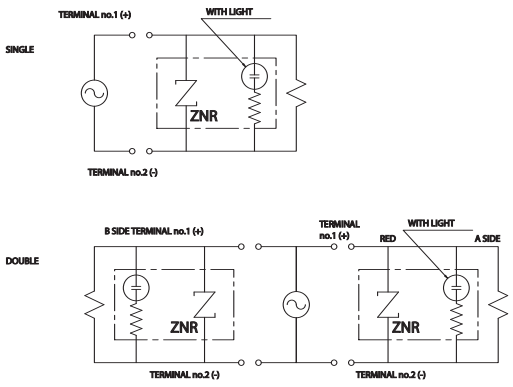
1. A filter of about 5 μm is adequate.
2. Remove contaminants from the system because excess contaminants cause pneumatic product malfunctions as well as environmental pollution.
   For added convenience, the use of an auto drain is recommended.
3. When there is a large amount of carbon powder from the compressor, it causes valve malfunction. Please change the compressor oil or install a mist separator.
4. The valve has been lubricated for life at manufacture, and does not require lubrication in service.
   If a lubricant is used in the system, use turbine oil (ISO VG32).

Solenoid Precautions

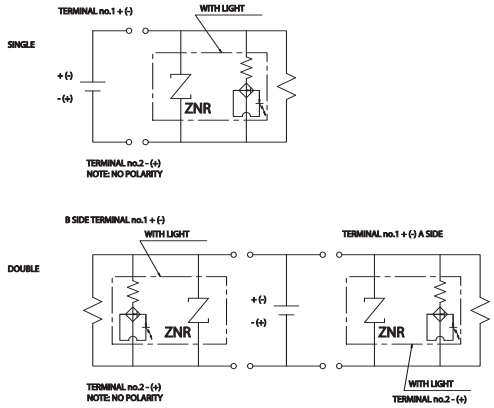
1. Ensure that voltage leakage across the coil is as follows.
   DC coil: No more than 3% of the rated voltage
   AC coil: No more than 20% of the rated voltage
2. Continuous duty
   When long term energizing is required, the continuous energizing time should not exceed 30 days.
3. Energization time
   The double solenoid valve must be energized for at least 0.1 second to ensure proper operation.

Wiring & Light / Surge Voltage Suppressor

AC AND 100 VDC



24VDC OR LESS



Piping

1. Flushing: Thoroughly flush the piping on both inlet and outlet sides of the valve to remove dust.
2. Mounting position: Mount the double solenoid and 3-position type valves so that the spool valve will be horizontal.
3. Installation in places subject to vibration: Mount the valve so that spool valve will be at right angles to direction of vibration.
   (Avoid use in places where vibration exceeds 5G.)
4. When 3-position closed center valve is mounted: Check the piping between the valve and cylinder as well as joints for leakage using soapy water. Even slight leakage should be avoided.
5. R(EXH) port piping: Take care that exhaust air is not throttled.

(Otherwise, delay in response or cylinder malfunction may result.)

Operation Conditions

Avoid the following locations or environments to prevent valve trouble.
If it is unavoidable install a cover, etc. for protection.

1. Locations where the ambient temperature exceeds +5~50ºC range.The metal seal type can be used down to -10ºC, but take care that solidification of contaminants or water freezing does not take place.
2. Locations where valves will be exposed directly to water drops, cutting oil, etc.
3. Locations exposed to direct sunlight.
4. Environments causing dewing on valve body or condensation when there are drastic temperature changes.
5. Locations exposed to corrosive gas, chemicals and their solution or vapor seawater, etc.

How to calculate Flow (At an air temperature 20ºC)

Subsonic flow: $P_1+0.1013<1.89(P_2+0.1013)$

$Q=226S\sqrt{\Delta P(P_2+0.1013)}$

Sonic flow: $P_1+0.1013>1.89(P_2+0.1013)$

$Q=113S(P_1+0.1013)$

Q: Flow rate under standard conditions [l/min(ANR)]
S: Effective area (mm^2)
ΔP: Pressure differential (P1-P2) (MPa)
P1: Upstream pressure (MPa)
P2: Downstream pressure (MPa)
* When the air temperatures is different, multiply the flow calculated with the above formula by the following factor.

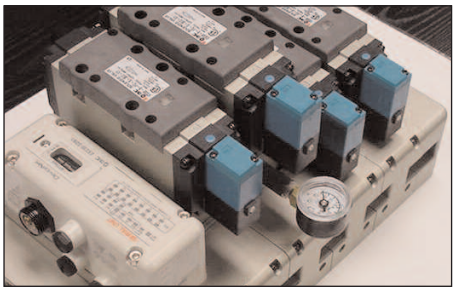
Air Temperature (Cº)	-20	-10	0	10	30	40	50	60
Factor	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94

Features / Options

Expandable Manifold
Stacking type manifold can be expanded up to the recommended number of stations. (Max. of 10 stations)

Various porting combinations available to suit your application.
Every manifold block comes standard with side and bottom ports.

Wide variety of Inerface Options
Individual supply/exhoust spacers, interface regulators and interface speed controls are available to customize your manifold



The manifold Series VV81 have a wide variety of functions and portings, compatible with virtually any application.

Standard Features

Common EXH Type

All the manifolded valves are supplied and exhausted by the same manifold ports. This is our most popular configuration.

Bottom Porting Type (A, B port)

When The application requires bottom porting, either a portion of, or the entire manifold can be piped with bottom porting.

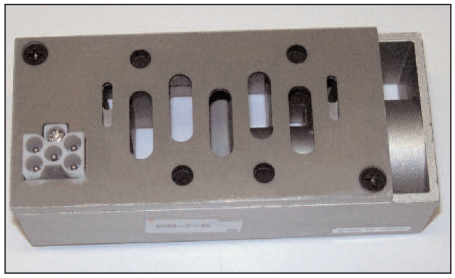
Interface Options

Individual EXH Spacer

An individual EXH spacer (VV81-R-■) mounted on the manifold block allows each valve to exhaust individually.

Individual SUP Spacer

An individual SUP spacer (VV81-P-■) mounted on the manifold block allows each valve to exhaust individually.

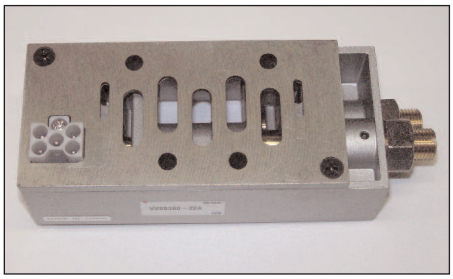


Interface Regulator

The interface unit is designated to separately control the pressure of one valve and still maintain a common manifold pressure.
This unit is available as either a P port regulator or as an A or B port regulator.

Interface Speed Controls

Cylinder speed can be controlled by throttling exhaust air.



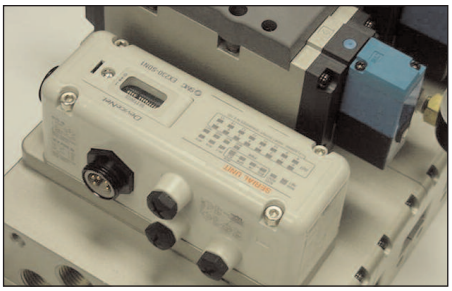
Manifold Option

Terminal Box

- Terminals are provided in the box, permitting connection of conduit piping.
- Simplifies wiring requirements

SI Unit

With serial interface unit
- Solenoid valve wiring reduced considerably.
- Applicable to Divice Net and Profi Bus.



Splash Proof

Splash proof manifold conforms to IP65 and NEMA4.
- Applicable to all sizes