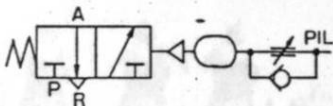


# Time Delay Valve

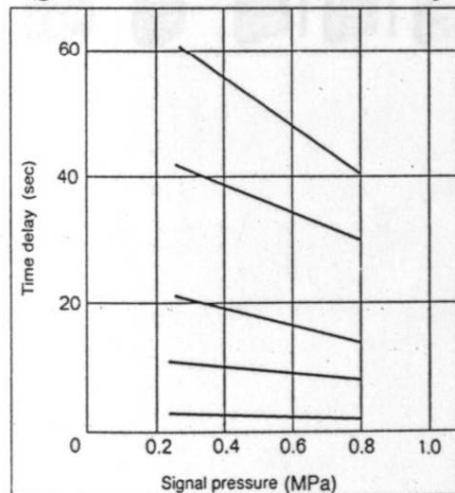
Combination of adjustable orifice and fixed flow allows transmission of a pneumatic signal after a fixed time period.



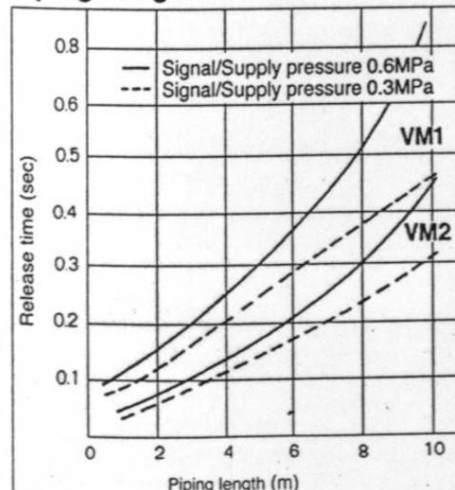
Symbol



## Signal Pressure vs. Time Delay



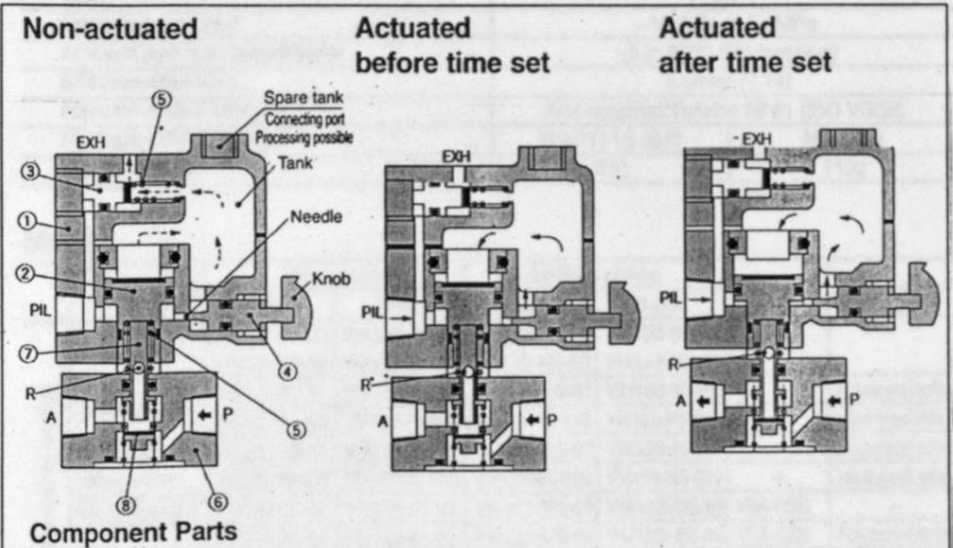
## Piping Length vs. Release Time



## Model/Specifications

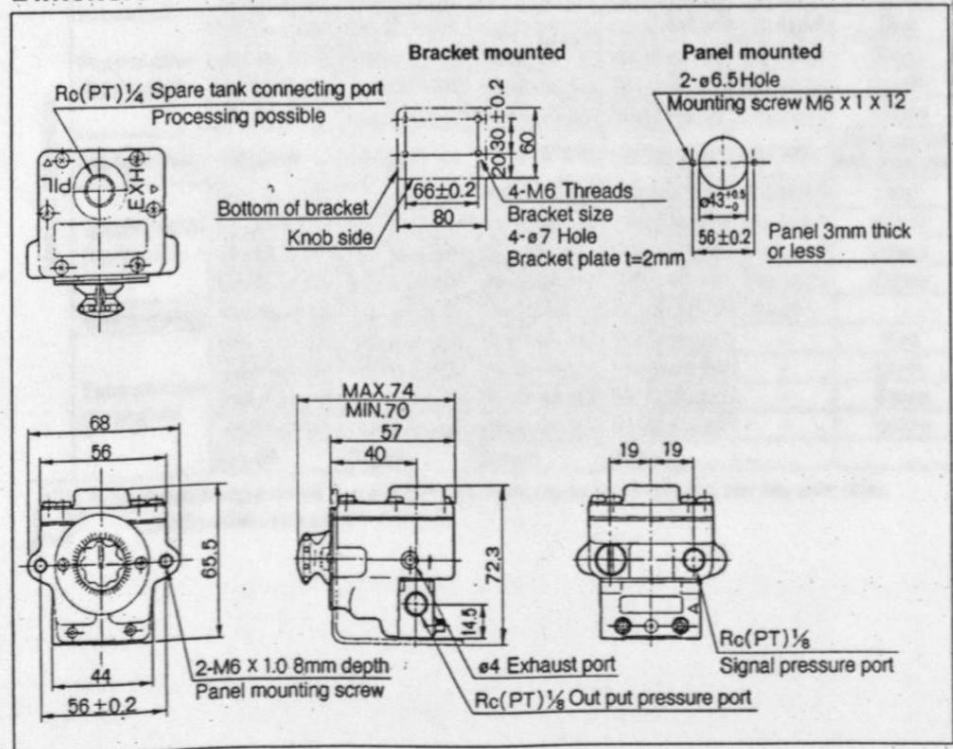
VR2110-01	
Supply pressure	0 to 1.0MPa
Signal pressure	0.25 to 0.8MPa
Time delay	0.5 to 60s
Repeatability	±10% F.S.
Operating and fluid temperature	-5 to 60°C (No freezing)
Effective area(Cv)	2.5mm <sup>2</sup> (0.14)
Port size (Nominal size)	Rc(PT) 1/8 (6A)
Weight	500g

## Construction



No.	Description	Material	Notes	No.	Description	Material	Notes
①	Body	Aluminum alloy	Metallic plated	⑤	Spring	Steel	
②	Piston	Brass, NBR	Rubber lined	⑥	Body	Zinc alloy	Metallic plated
③	Piston	Brass, NBR	Rubber lined	⑦	Plunger	Stainless steel	
④	Needle	Brass		⑧	Valve	Brass, NBR	Rubber lined

## Dimensions



## 2/3 Port Mechanical Valve

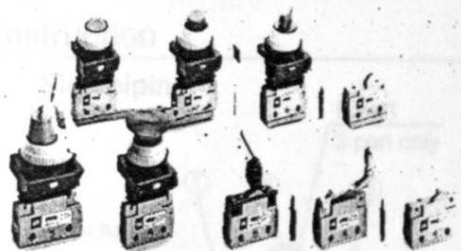
# Series VM100

Compact size.

Porting options: Side porting

Bottom porting

A variety of actuator styles.



### Specifications

Piping	Side piping	Bottom piping
Fluid	Air	
Operating pressure	-100kPa to 1.0MPa	
Ambient and fluid temperature	-5 to 60°C (No freezing)	
Effective area (Cv)	2.5mm <sup>2</sup> (0.14)	
Recommended lubricant	Not required/Turbine oil #1 (ISO VG32)	
Port size (Nominal size)	Rc(PT) 1/8 (6A)	M5 X 0.8
Weight (Basic)	95g	110g

### Model

	Side piping		Bottom piping		Part No.	Application	
	2 port	3 port	2 port	3 port			
Mechanical operation	Basic	VM120-01-00	VM130-01-00	VM122-M5-00	VM132-M5-00	-	
		VM121-01-00	VM131-01-00	VM123-M5-00	VM133-M5-00	-	
	Roller lever	VM121-01-01	VM130-01-01	VM123-M5-01	VM133-M5-01	-	Polyacetal roller
		VM121-01-01S	VM131-01-01S	VM123-M5-01S	VM133-M5-01S	-	Hard steel roller
	One way roller lever	VM121-01-02	VM131-01-02	VM123-M5-02	VM133-M5-02	-	Polyacetal roller
		VM121-01-02S	VM131-01-02S	VM123-M5-02S	VM133-M5-02S	-	Hard steel roller
	Straight plunger	VM120-01-05	VM130-01-05	VM122-M5-05	VM132-M5-05	VM-05B	-
		VM120-01-06	VM130-01-06	VM122-M5-06	VM132-M5-06	VM-06B	Polyacetal roller
	Roller plunger	VM120-01-06S	VM130-01-06S	VM122-M5-06S	VM132-M5-06S	VM-06BS	Hard steel roller
		VM120-01-07	VM130-01-07	VM122-M5-07	VM132-M5-07	VM-07B	Polyacetal roller
	Cross roller plunger	VM120-01-07S	VM130-01-07S	VM122-M5-07S	VM132-M5-07S	VM-07BS	Hard steel roller
		VM120-01-08	VM130-01-08	VM122-M5-08	VM132-M5-08	VM-08B	-
Manual operation	Toggle lever	VM120-01-30R	VM130-01-30R	VM122-M5-30R	VM132-M5-30R	VM-30AR	Red
		VM120-01-30B	VM130-01-30B	VM122-M5-30B	VM132-M5-30B	VM-30AB	Black
	Push button (Mushroom)	VM120-01-30G	VM130-01-30G	VM122-M5-30G	VM132-M5-30G	VM-30AG	Green
		VM120-01-30Y	VM130-01-30Y	VM122-M5-30Y	VM132-M5-30Y	VM-30AY	Yellow
		VM120-01-32R	VM130-01-32R	VM122-M5-32R	VM132-M5-32R	VM-32AR	Red
Push button (Extended)	VM120-01-32B	VM130-01-32B	VM122-M5-32B	VM132-M5-32B	VM-32AB	Black	
	VM120-01-32G	VM130-01-32G	VM122-M5-32G	VM132-M5-32G	VM-32AG	Green	
	VM120-01-32Y	VM130-01-32Y	VM122-M5-32Y	VM132-M5-32Y	VM-32AY	Yellow	
Push button (Flush)	VM120-01-33	VM130-01-33	VM122-M5-33	VM132-M5-33	VM-33A	With a set of red, black, green, yellow	
Twist selector (2 position)	VM120-01-34R	VM130-01-34R	VM122-M5-34R	VM132-M5-34R	VM-34AR	Red	
	VM120-01-34B	VM130-01-34B	VM122-M5-34B	VM132-M5-34B	VM-34AB	Black	
	VM120-01-34G	VM130-01-34G	VM122-M5-34G	VM132-M5-34G	VM-34AG	Green	
	VM120-01-34Y	VM130-01-34Y	VM122-M5-34Y	VM132-M5-34Y	VM-34AY	Yellow	
Key selector (2 position)	VM120-01-36	VM130-01-36	VM122-M5-36	VM132-M5-36	VM-36A	-	
Twist selector (3 position)	VM131-01-35R	VM151-01-35R	VM133-M5-35R	VM153-M5-35R	-	Red	
	VM131-01-35B	VM151-01-35B	VM133-M5-35B	VM153-M5-35B	-	Black	
	VM131-01-35G	VM151-01-35G	VM133-M5-35G	VM153-M5-35G	-	Green	
	VM131-01-35Y	VM151-01-35Y	VM133-M5-35Y	VM153-M5-35Y	-	Yellow	
	(3 port)	(5 port)	(3 port)	(5 port)			



Note) Actuator replacement is available for all styles except for roller lever, one way roller lever, and 3 position selector.

# How To Order

VM1 3 1 01 01 S

**Port size**

01	Rc(PT) 1/8
M5	M5 X 0.8 (Female thread)

**Piping direction and plunger length**

	Side	
	0 Long	1 Short
	Bottom	
	2 Long	3 Short

**Number of ports**

2	2 ports
3	3 ports

**Actuator**

00	Basic
01	Roller lever
02	One way roller lever
05	Straight plunger
06	Roller plunger
07	Cross roller plunger
08	Toggle lever
30	Push button (Mushroom)
32	Push button (Extended)
33	Push button (Flash)
34	Twist selector (2 position)
36	Key selector (2 position)
35	Twist selector (3 position)

**Suffix of actuator**

S	Hard steel roller
R	Red
B	Black
G	Green
Y	Yellow

Color of push button

**Indicator**

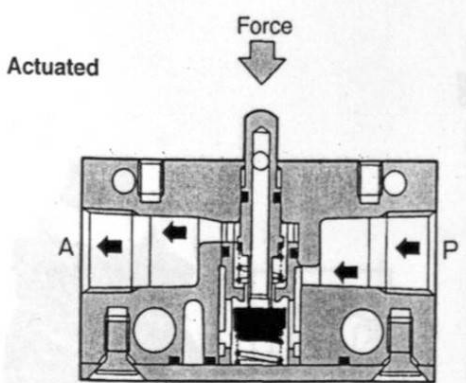
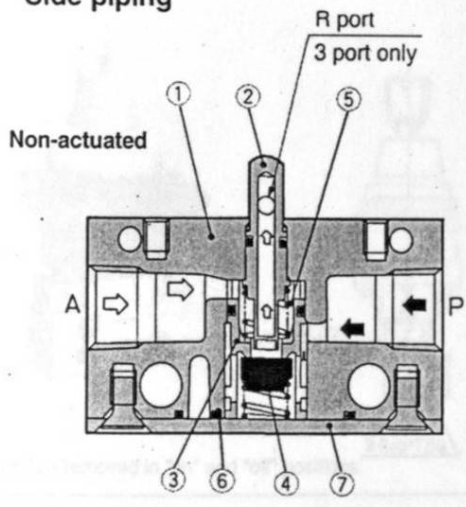
Z	W/ miniature indicator (Bottom piping only.)
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Possible combination: O, Impossible combination: X

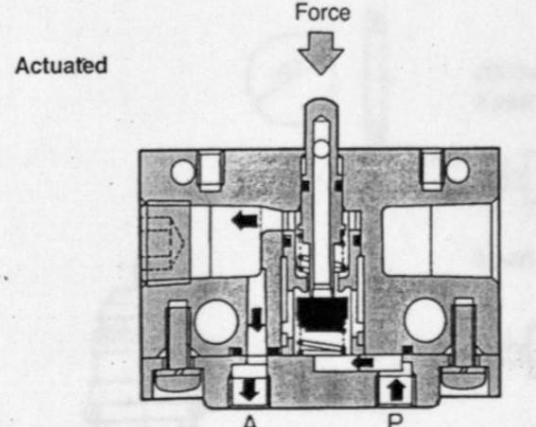
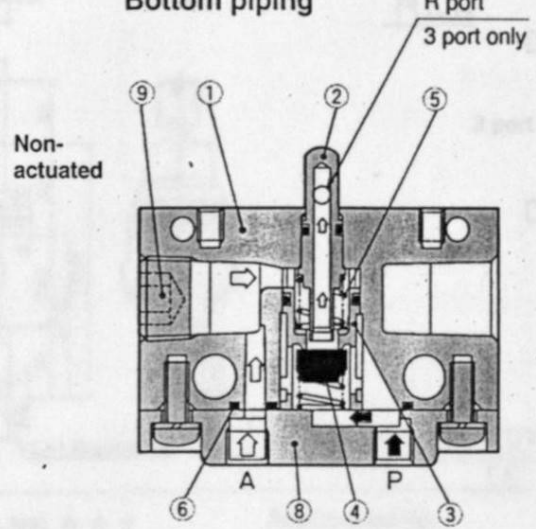
Actuator	Plunger length	Side		Bottom	
		Long	Short	Long	Short
Basic	00	O	O	O	O
Roller lever	01	X	O	X	O
One way roller lever	02	X	O	X	O
Straight plunger	05	O	X	O	X
Roller plunger	06	O	X	O	X
Cross roller plunger	07	O	X	O	X
Toggle lever	08	O	X	O	X
Push button (Mushroom)	30	O	X	O	X
Push button (Extended)	32	O	X	O	X
Push button (Flash)	33	O	X	O	X
Twist selector (2 position)	34	O	X	O	X
Key selector (2 position)	36	O	X	O	X
Twist selector (3 position)	35	X	O	X	O

## Construction

Side piping



Bottom piping



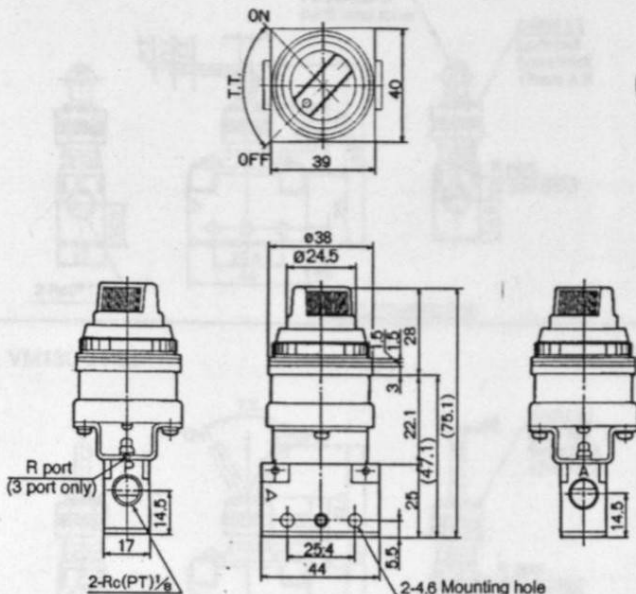
### Component Parts

No.	Description	Material	Notes
1	Body	Zinc alloy	Metallic plated
2	Plunger	Polyacetal	
3	Valve seat	Polyacetal	
4	Valve	NBR	
5	Spring	Stainless steel	

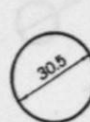
No.	Description	Material	Notes
6	Gasket	NBR	
7	Cover	Rolled steel	
8	Subplate	Zinc alloy	Metallic plated
9	Hexagon socket head plug	Rolled steel	

Series VM100/Side Piping

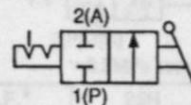
Twist Selector (2 position)/VM120-01-34R, B, G, Y/VM130-01-34R, B, G, Y



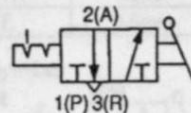
Panel mounted hole



JIS Symbol  
2 port



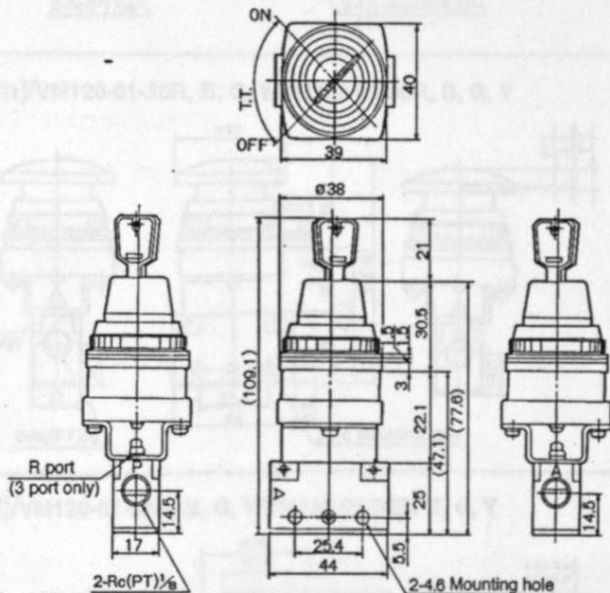
3 port



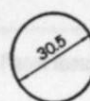
\* 0.5MPa supply

F.O.F.*	15N
T.T.	90°

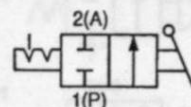
Key Selector (2 position)/VM120-01-36, VM130-01-36



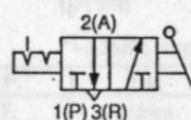
Panel mounted hole



JIS Symbol  
2 port



3 port

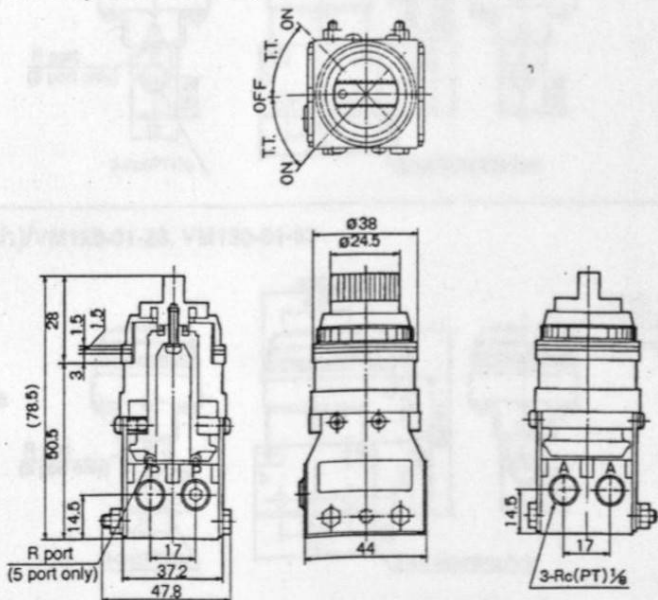


\* 0.5MPa supply

F.O.F.*	15N
T.T.	90°

Key can be removed in "on" and "off" positions.

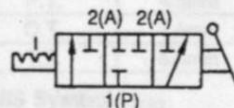
Twist Selector (3 position)/VM131-01-35R, B, G, Y/VM151-01-35R, B, G, Y



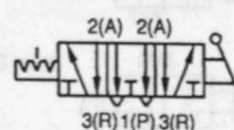
Panel mounted hole



JIS Symbol  
2 port



3 port

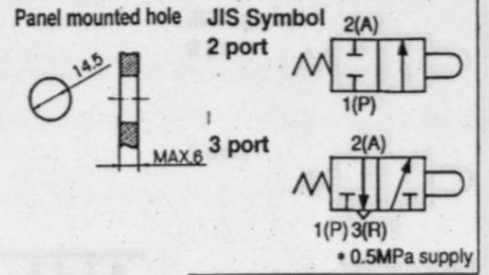
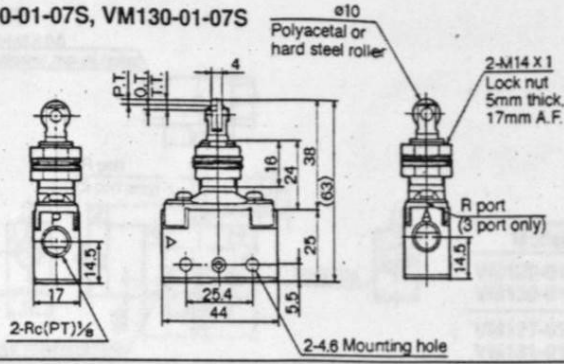


\* 0.5MPa supply

F.O.F.*	15N
T.T.	45°

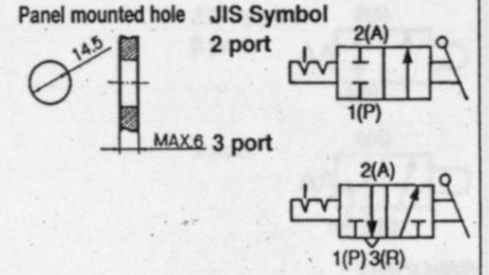
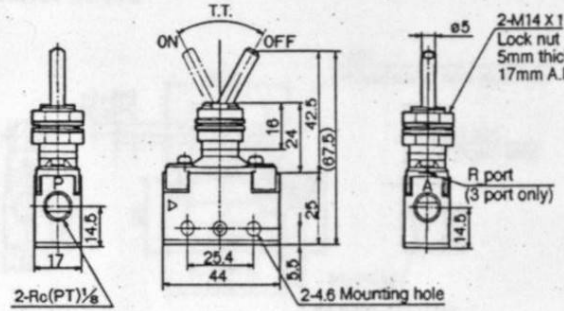
Series VM100/Side Piping

Cross Roller Plunger/VM120-01-07, VM130-01-07  
VM120-01-07S, VM130-01-07S



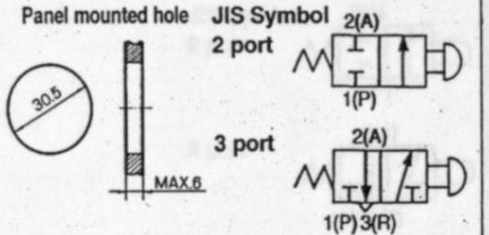
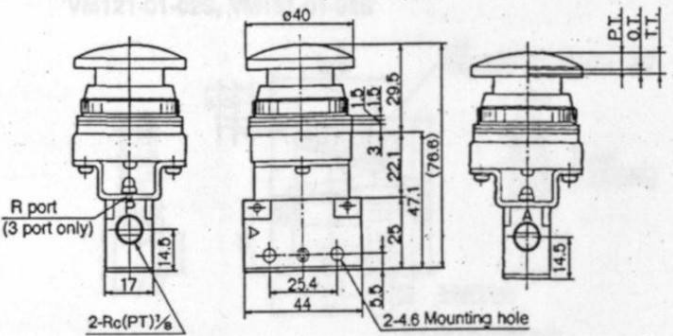
F.O.F.*	23N
P.T.	2mm
O.T.	1.5mm
T.T.	3.5mm

Toggle Lever/VM120-01-08, VM130-01-08



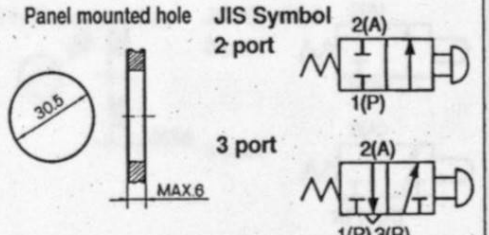
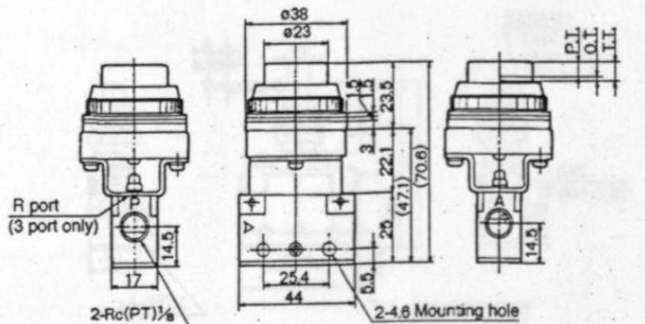
F.O.F.*	10N
T.T.	60°

Push Button (Mushroom)/VM120-01-30R, B, G, Y/VM130-01-30R, B, G, Y



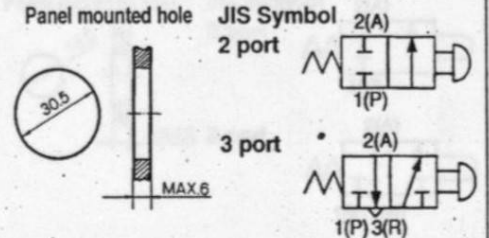
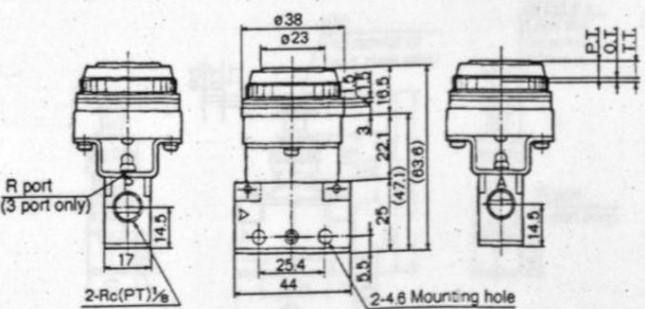
F.O.F.*	21N
P.T.	4.9mm
O.T.	1.6mm
T.T.	6.5mm

Push Button (Extended)/VM120-01-32R, B, G, Y/VM130-01-32R, B, G, Y



F.O.F.*	21N
P.T.	4.9mm
O.T.	1.6mm
T.T.	6.5mm

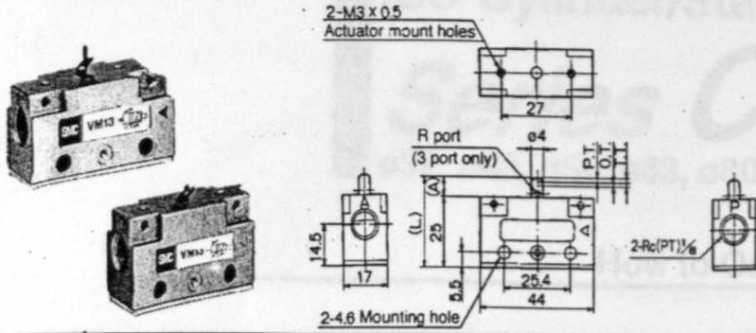
Push Button (Flush)/VM120-01-33, VM130-01-33



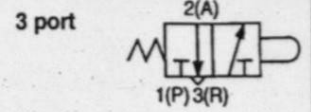
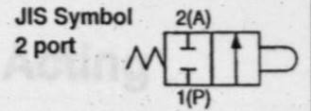
F.O.F.*	21N
P.T.	4.9mm
O.T.	1.6mm
T.T.	6.5mm

Series VM100/Side Piping

Basic/VM120-01-00, VM130-01-00  
VM121-01-00, VM131-01-00



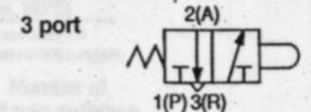
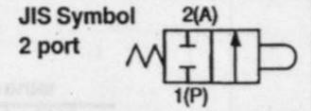
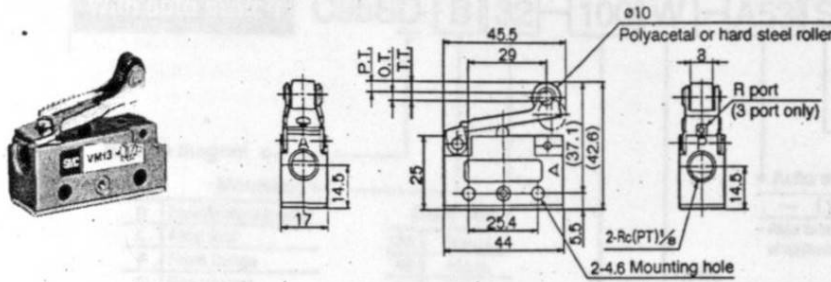
Model	L	A
VM120-01-00 VM130-01-00	32.5	7.5
VM121-01-00 VM131-01-00	28.5	3.5



\* 0.5MPa supply

F.O.F.*	20N
P.T.	1.5mm
O.T.	1.5mm
T.T.	3mm

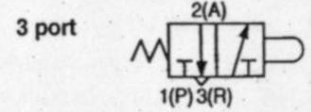
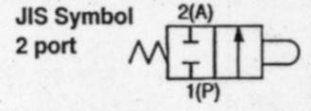
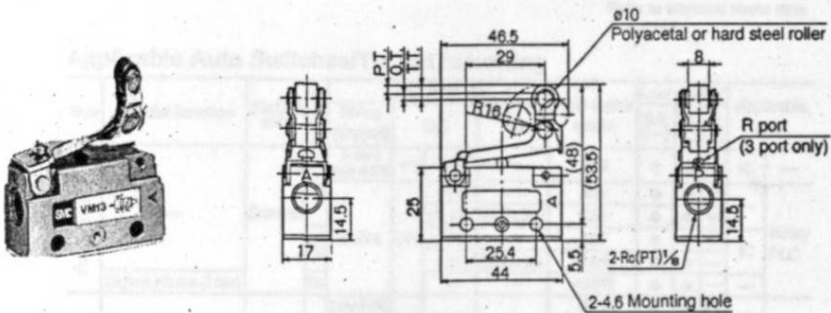
Roller Lever/VM121-01-01, VM131-01-01  
VM121-01-01S, VM131-01-01S



\* 0.5MPa supply

F.O.F.*	10N
P.T.	3.2mm
O.T.	2.3mm
T.T.	5.5mm

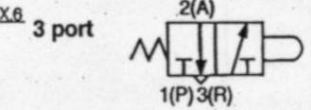
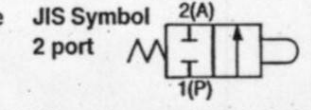
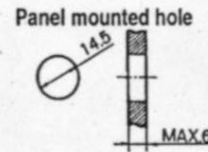
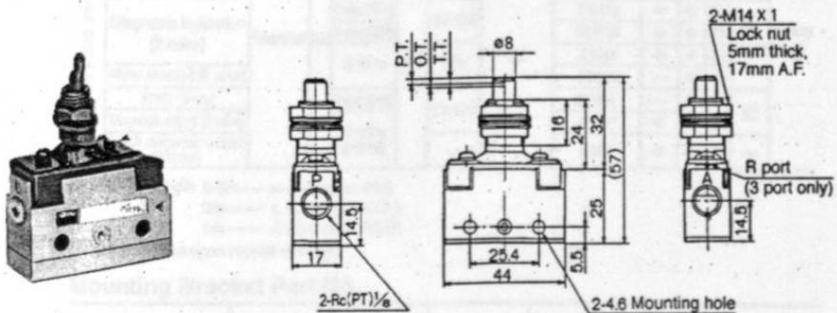
One Way Roller Lever/VM121-01-02, VM131-01-02  
VM121-01-02S, VM131-01-02S



\* 0.5MPa supply

F.O.F.*	10N
P.T.	3.2mm
O.T.	2.3mm
T.T.	5.5mm

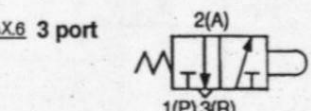
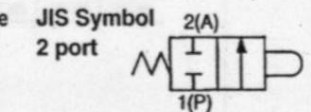
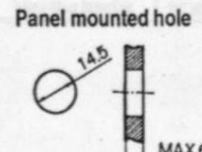
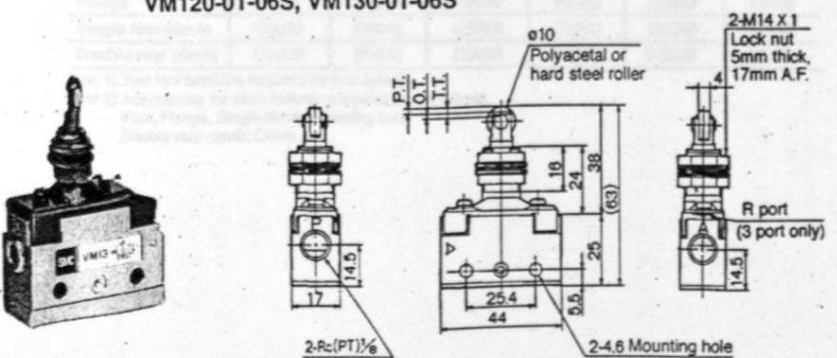
Straight Plunger/VM120-01-05, VM130-01-05



\* 0.5MPa supply

F.O.F.*	23N
P.T.	2mm
O.T.	1.5mm
T.T.	3.5mm

Roller Plunger/VM120-01-06, VM130-01-06  
VM120-01-06S, VM130-01-06S



\* 0.5MPa supply

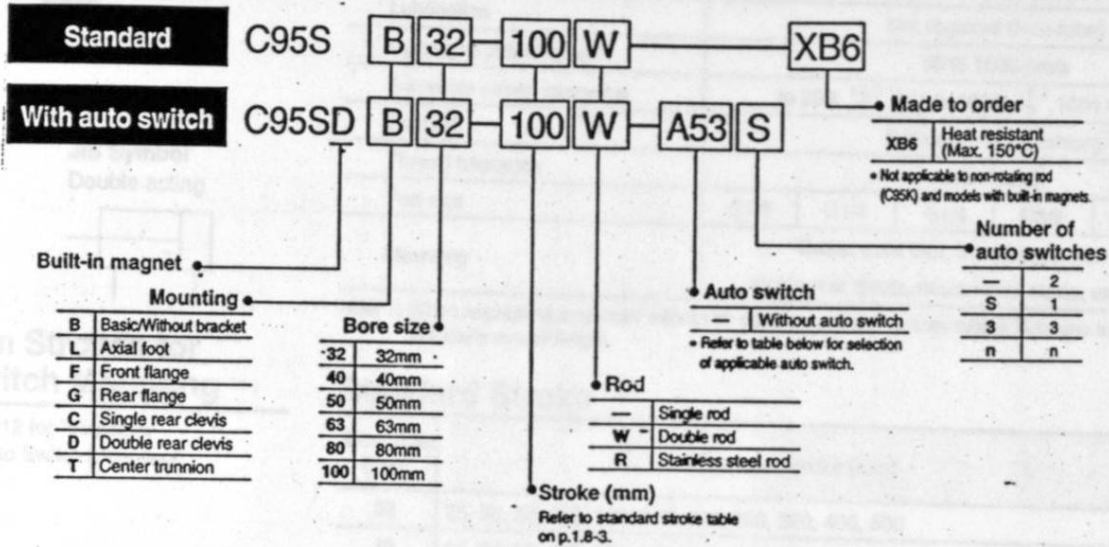
F.O.F.*	23N
P.T.	2mm
O.T.	1.5mm
T.T.	3.5mm

# ISO Cylinder/Standard: Double Acting

## Series C95

ø32, ø40, ø50, ø63, ø80, ø100

### How to Order



### Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage		Auto switch model	Lead wire (m)			Applicable load																																																																		
				DC	AC		0.5 (-)	3 (L)	5 (Z)																																																																			
Reed switch	—	Grommet	Yes	3 wire (Equip. to NPN)	5V	—	A56	●	●	—	IC																																																																	
					12V	—	A53	●	●	●	—	Relay PLC																																																																
					5V, 12V	100V, 200V	A54	●	●	●	—																																																																	
					24V	5V, 12V	—	A67	●	●	—	—																																																																
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	—	—	—	IC																																																																	
												3 wire (PNP)	—	100V, 200V	—	—	—	—	—	—																																																								
																					2 wire	—	—	—	—	—	—	—																																																
																													3 wire (NPN)	5V, 12V	—	—	—	—	—	—																																								
																																					3 wire (PNP)	—	—	—	—	—	—	—																																
																																													2 wire	24V	12V	—	—	—	—	—																								
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																																																													3 wire (PNP)	5V, 12V	—	—	—	—	—	—								
																																																																					2 wire	—	—	—	—	—	—	—
3 wire (PNP)	—	—	—	—	—	—	—																																																																					
								2 wire	—	—	—	—	—	—	—																																																													
																3 wire (NPN)	5V, 12V	—	—	—	—	—	—																																																					
																								4 wire (NPN)	—	—	—	—	—	—	—																																													

• Lead wire length 0.5m----- (Example: A53)  
 3m----- L (Example: A53L)  
 5m----- Z (Example: A53Z)

O: Manufactured upon receipt of order.

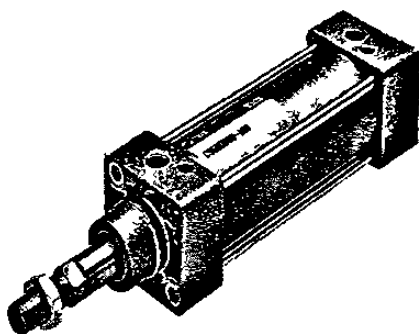
### Mounting Bracket Part No.

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Foot <sup>(1)</sup>	L5032	L5040	L5050	L5063	L5080	L5100
Flange	F5032	F5040	F5050	F5063	F5080	F5100
Single rear clevis	C5032	C5040	C5050	C5063	C5080	C5100
Double rear clevis	D5032	D5040	D5050	D5063	D5080	D5100

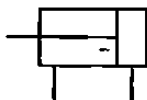
### Auto Switch Mounting Bracket Part No.

Bore size	ø32, ø40	ø50, ø63	ø80, ø100
Mounting bracket	BT-03	BT-05	BT-06

Note 1) Two foot brackets required for one cylinder.  
 Note 2) Accessories for each mounting bracket are as follows.  
 Foot, Flange, Single clevis: Mounting bolts  
 Double rear clevis: Clevis pin



JIS Symbol  
Double acting



## Specifications

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.05MPa					
Ambient and fluid temperature	Without magnet -10 to 70°C (No freezing)					
	With magnet -10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	to 250 <sup>+1.0</sup> <sub>0</sub> , 251 to 1000 <sup>+1.4</sup> <sub>0</sub> , 1001 to 1500 <sup>+1.8</sup> <sub>0</sub>					
Cushion	Both ends (Air cushion) (1)					
Thread tolerance	JIS class 2					
Port size	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Mounting	Basic, axial foot, front flange, rear flange, single rear clevis, double rear clevis, center trunnion					

Note 1) When requesting a cylinder without air cushion, cylinder utilizes rubber bumpers which increase cylinder's overall length.

## Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1400
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1500

Intermediate strokes are available.

\* Consult SMC for longer strokes

## Applicable Auto Switches

Style	Auto switch model	Electrical entry (function)
Reed switch	D-A5□/A6□	Grommet
	D-A59W	Grommet (2 color indication)
Solid state switch	D-F5□/J5□	Grommet
	D-F5□W/J59W□	Grommet (2 color indication)
	D-F5BA	Grommet (2 color Water resistant)
	D-F5□F	Grommet (2 color, diagnosis output)
	D-F5NT	Grommet (Timer)

## Accessories

Mounting		Basic	Foot	Front flange	Rear flange	Single rear clevis	Double rear clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single rod clevis	●	●	●	●	●	●	●
	Double rod clevis (with pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

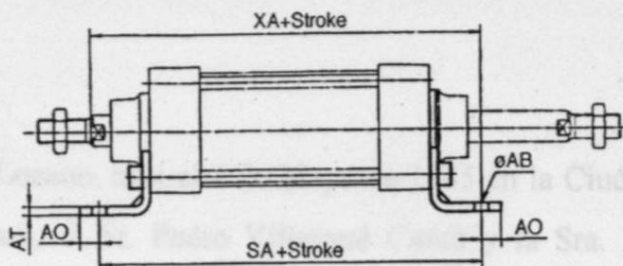
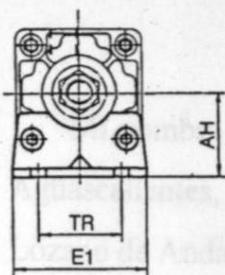
## Minimum Strokes for Auto Switch Mounting

Refer to p 1 8-12 for "Minimum Strokes for Auto Switch Mounting"

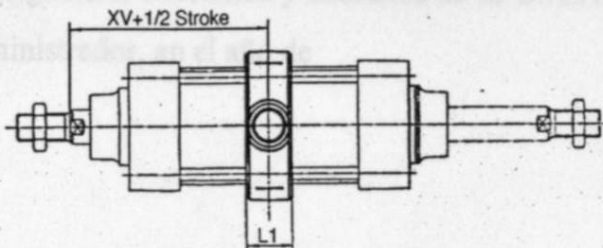
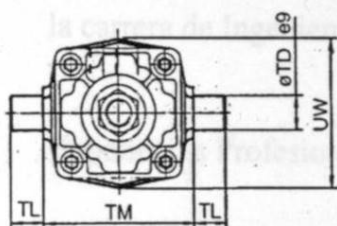


With Mounting Bracket

Foot L

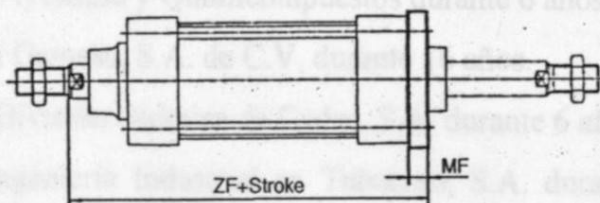
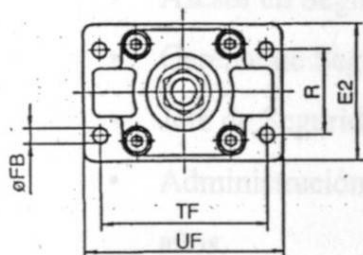


Centre trunnion T

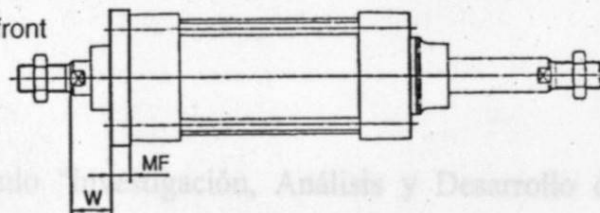


Flange F

Mounting at the back

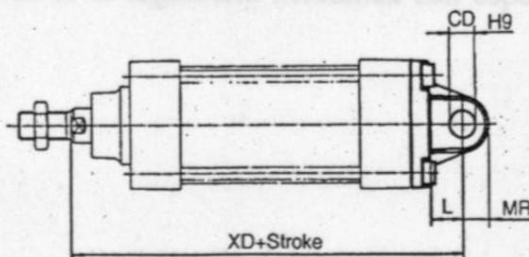
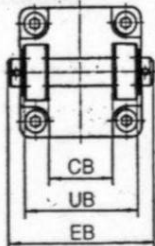
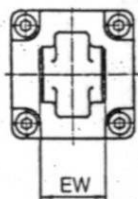


Mounting at the front



Rear single clevis C

Rear double clevis D



Bore (mm)	E1	R	W	MF	ZF	øFB	CD	EB	L	XD	UB	CB	EW	MR	TR	AO	AT	XA	SA	AH	øAB	L1	XV	TL	øTD	TM	UW	TF	UF	E2
32	48	32	16	10	130	7	10	65	12	142	45	26	26	9.5	32	10	4.5	144	142	32	7	17	73	12	12	50	49	64	79	50
40	55	36	20	10	145	9	12	75	15	160	52	28	28	12	36	11	4.5	163	161	36	10	22	82.5	16	16	63	58	72	90	55
50	68	45	25	12	155	9	12	80	15	170	60	32	32	12	45	12	5.5	175	170	45	10	22	90	16	16	75	71	90	110	70
63	80	50	25	12	170	9	16	90	20	190	70	40	40	16	50	12	5.5	190	185	50	10	28	97.5	20	20	90	87	100	120	80
80	100	63	30	16	190	12	16	110	20	210	90	50	50	16	63	14	6.5	215	210	63	12	34	110	20	20	110	110	126	153	100
100	120	75	35	16	205	14	20	140	25	230	110	60	60	20	75	16	6.5	230	220	71	14.5	40	120	25	25	136	150	178	120	

# RESUMEN AUTOBIOGRÁFICO

**Mi nombre es Jesús Villarreal Lozano, nací el 4 de Mayo de 1945 en la Ciudad de Aguascalientes, Ags. Mis padres son, el Sr. Pedro Villarreal Cantú y la Sra. María Lozano de Anda**

**Soy egresado de la Facultad de Ingeniería Mecánica y Eléctrica de la U.A.N.L. de la carrera de Ingeniero Mecánico Administrador, en el año de**

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- **Asesor en Seguridad Industrial en Ayensasa y Quimicompuestos durante 6 años.**
- **Gerente de Seguridad Industrial en Gamesa, S.A. de C.V. durante 16 años.**
- **Jefe de Seguridad Industrial en la División Química de Cydsa, S.A. durante 6 años.**
- **Administración de Proyectos e Ingeniería Industrial en Tubacero, S.A. durante 2 años.**

**Este trabajo que lleva como título "Investigación, Análisis y Desarrollo de un Manual para el Diseño en un Sistema Neumático". Es presentado en calidad de Tesis con opción al Título de Maestro en ciencias de la Ingeniería Mecánica con especialidad en Térmica y Fluidos.**



