

CONTROLLI

Automatic Controls for Systems of:

Air Conditioning
Heating
Industrial process



Issue 07/2006



LITERATURE

	<i>Controlli makes available for its customers the following literature:</i>
Data Sheets	specify manufacturing and technical characteristics of the products and their application, installation, wiring connections and start-up instructions.
Catalogue	gives a brief description of Controlli product range according to different application type.
General Instructions	provide the information for the correct use of the equipment and for its maintenance.
Brochures	advertise single Controlli products or control systems.
Application Diagrams	illustrate the most common applications, indicating the equipment of control system, basic system and wiring diagram.
Price List	lists the prices and sales conditions.

SERVICES

	<i>Controlli offers customers the following services:</i>
Application Engineering Office	available for technical information, selection, application and quotations of equipment and complete control systems.
Sales Service	consisting of our technical staff and authorized assistants for technical support, commissioning, repairs and maintenance.
Technical Training Courses	courses are held periodically for both technical and commercial staff on equipment and control systems. Moreover, there are courses aimed at the users of digital supervision systems.

GROWING PRESENCE

	CONTROLLI, in recent years, has obtained a significant presence in large and prestigious buildings and became a market leader in control systems which are:
oriented configuration	high functional modularity
high accuracy	advanced circuit solutions
elevated quality standard	robotizes techniques in production with planned checks
excellent performances	reliability in time: oriented project criteria and life-test validation



1	ELECTROMECHANICAL CONTROLS	200 LINE - On-Off / Floating Control <ul style="list-style-type: none">6 Room thermostats<ul style="list-style-type: none">Humidity SwitchesBulb thermostatsFan-coil thermostatAnti-frost thermostatsImmersion thermostats7 Pressure switches<ul style="list-style-type: none">Differential pressure switchesFlow switchesLevel controllers
		300 LINE - Balance Potentiometer Proportional Control <ul style="list-style-type: none">10 Bulb thermostats<ul style="list-style-type: none">AccessoriesPressure switchesLevel controllers

2	SYSTEMS AND CONTROLS FOR HEATING PLANTS AND INDUSTRIAL PROCESSES	200 LINE - On-Off / Floating Control <ul style="list-style-type: none">12 Room thermostats<ul style="list-style-type: none">Fan coil electronic controllersSensorsRoom chronothermostat
		500 LINE - V d.c. Output Proportional Control <ul style="list-style-type: none">13 Temperature controllers
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4	FAN-COILS AND VAV UNITS SYSTEMS	700 LINE - Microprocessor Floating Control <ul style="list-style-type: none">25 Room temperature controllers<ul style="list-style-type: none">Return temperature sensor
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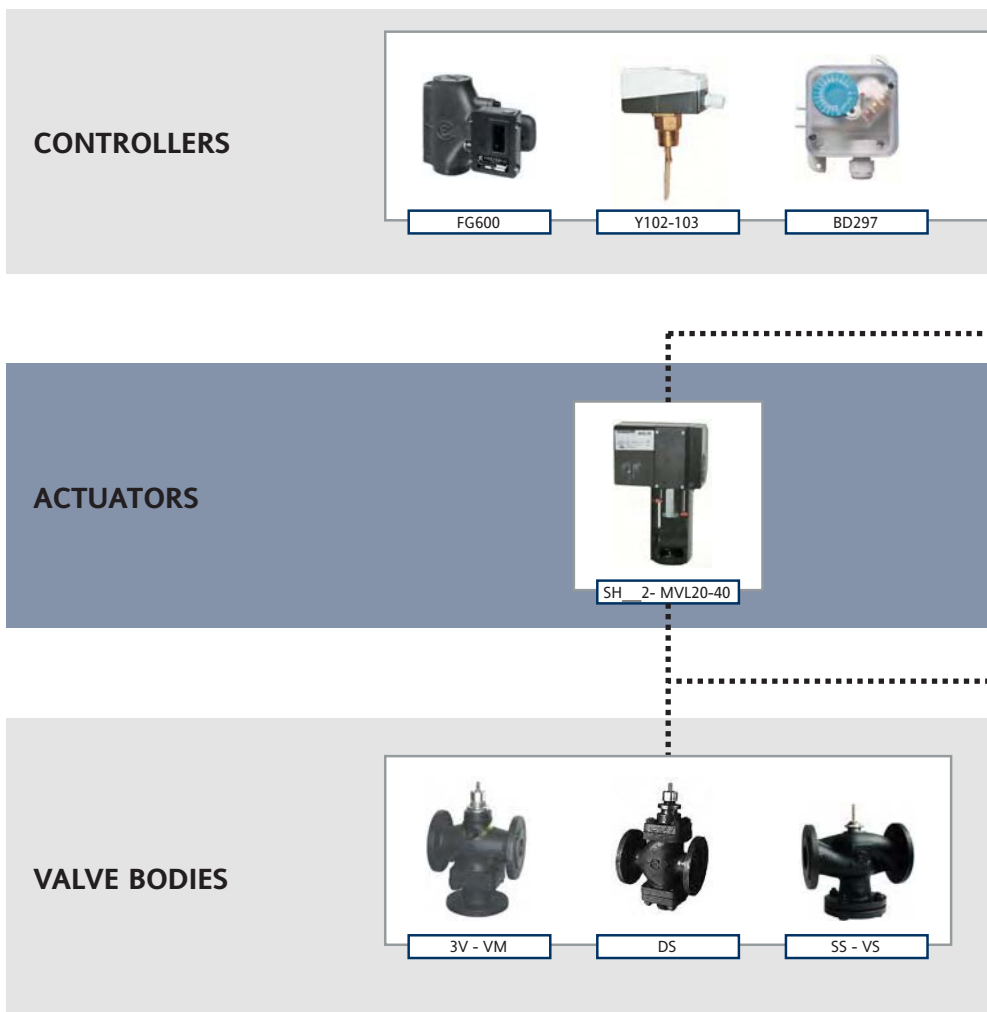


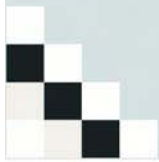
200 Line On-Off / Floating Control

GENERAL INFORMATION

On-Off controllers are fitted with a snap-acting SPDT switch; the variation of the measured unit, equal to the differential, causes the contacts to switch.
The floating controllers are fitted with an electric SPDT contact with dead zone.

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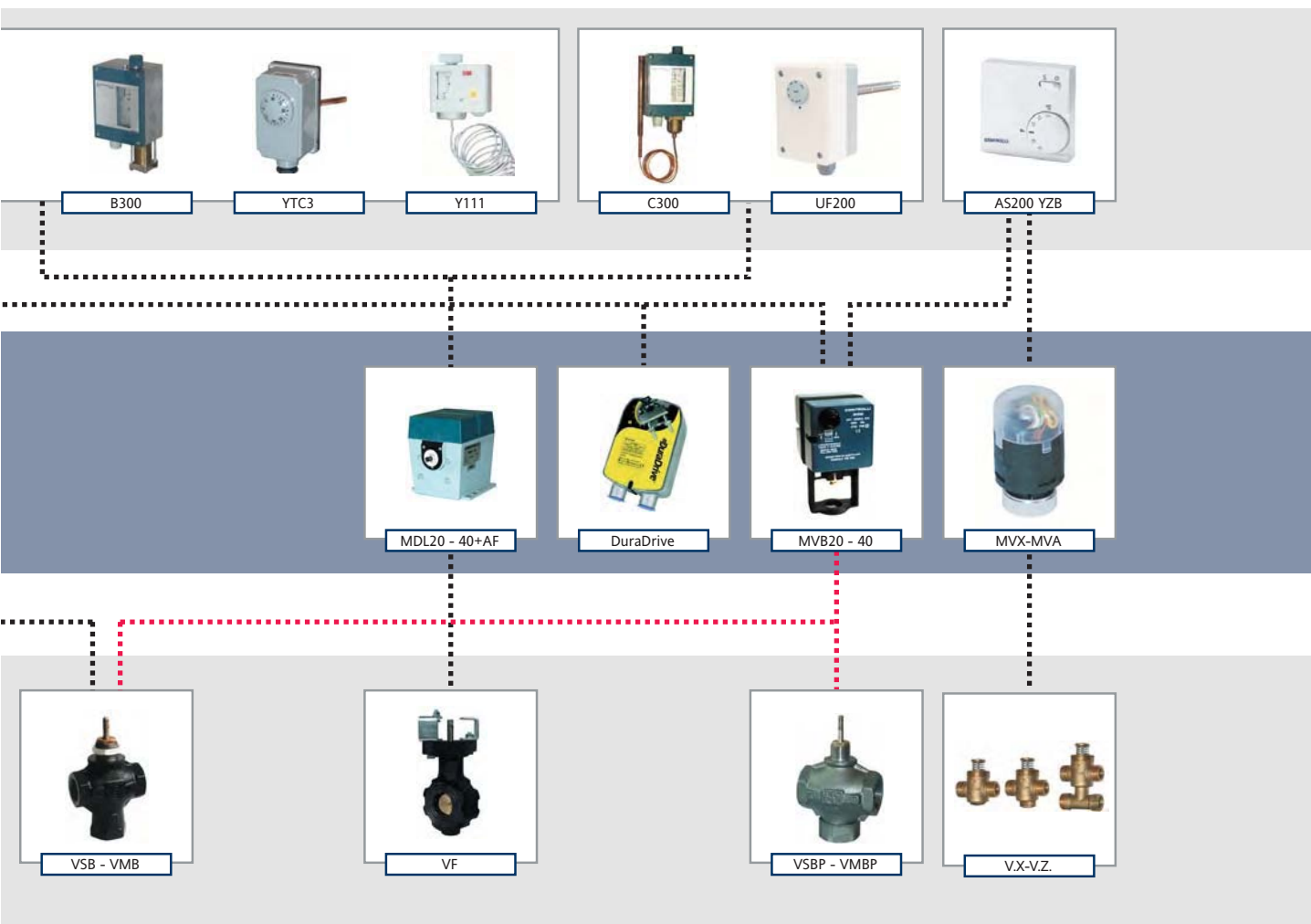




electromechanical controls

Controlled devices

The field devices driven by On-Off controllers are: relays, contactors, solenoid valves, zone or fan coil valves MVA+V.Z, DuraDrive damper actuators, V.BP+MVB46 valves. Controlled devices operated both by On-Off and floating controllers are bidrection damper actuators MDL2./4. and globe valves actuators MVT4. - SH222-242 MVB2. - MVL2./4.



electromechanical controls

200 Line



Room Thermostats

Series AS200 - Bimetal thermal element. IP30 protection.

MODEL	RANGE °C	DIFFERENTIAL K	OTHER CHARACTERISTICS
AS205	10 to 30	1	SPDT 5 (2) A-250 Vac - summer/winter changeover - 3 speed fan selector
AS206	5 to 30	0,5	SPDT, Power supply 230 Vac
AS207	5 to 30	0,5	As above but SPST, and summer/winter change-over

Humidity Switches

Series UF200 - Sensitive synthetic fibre element - UF215 room type - UF217 duct type with 235 mm immersion pipe.

MODEL	RANGE % R.H.	DIFFERENTIAL % R.H.	OTHER CHARACTERISTICS
UF215	35 to 95	4	SPDT 2 (2) A-240 V a.c.- IP30 protection
UF217	30÷100	3..6	SPST 15 (2) A - 250 Vca - IP64 protection

Bulb Thermostats

Series C300 - Steam filled sensing element - Differential 2.5 to 5 K - SPDT 15 (2.5) A-250 V a.c. Die-cast aluminium case IP 55.

MODEL	RANGE °C	MAX SAFE TEMPERAT. °C	OTHER CHARACTERISTICS
C307	20 to 70	85	copper bulb and capillary 2 m long
C309	95 to 140	155	"
G1	copper well 3/4" gas 180 mm long		
R1	brass gland nut 3/4" gas with packing		

Fan-coil Thermostat

Series YZB - Liquid filled sensing element - Copper bulb and capillary 1 m long. SPDT 15 (2.5) A-230 V a.c. - IP43 protection.

MODEL	RANGE °C	DIFFERENTIAL K	OTHER CHARACTERISTICS
YZB	0 to 40	2	setting knob and lock nut

Anti-frost Thermostats

Series Y111 - Steam- filled sensing element - 6 m long capillary. SPST contact 16 (16) A-250 V a.c. - IP43 protection.

Note: For correct operation, the bulb must have a lower temperature with respect to the controller.

MODEL	RANGE °C	DIFFERENTIAL K	OTHER CHARACTERISTICS
Y111	-18 to 13	3	max safe temperature 200 °C with external set
Y111RM	-18 to 13	-	as above with manual reset

Immersion Thermostats

Series YTC3 - Liquid-filled sensing element - SPDT 10 (2.5) A-250 V a.c.- IP 40

MODEL	RANGE °C	DIFFERENTIAL K	OTHER CHARACTERISTICS
YTC3	0 to 90	3	copper well gas 3/4" - 100 mm long
YTC3RM	90 to 110		as above with manual reset

Pressure Switches

Series B300 - Metal bellows sensing element - SPDT 15 (2.5) A-250 V a.c. - Die-cast aluminium case IP 55.

MODEL	RANGE kPa	DIFFERENTIAL kPa	MAX SAFE PRESSURE kPa	OTHER CHARACTERISTICS
B301	10 to 200	7 to 30	600	copper alloy bellows
B302	100 to 600	15 to 120	900	"
B303	200 to 1400	60 to 400	2200	"
B304	500 to 3000	80 to 400	3800	"
B301X	10 to 200	7 to 30	600	AISI 316 stainless steel bellows
B302X	100 to 600	15 to 120	900	"
B303X	200 to 1400	60 to 400	2200	"
B304X	500 to 3000	80 to 400	3800	"

Differential Pressure Switches

Series BD200 - Differential pressure switch for signaling dirty air filter - Membrane sensing element - SPDT 1 (0.5) A-230 V a.c.

MODEL	RANGE Pa	MAX SAFE PRESSURE kPa	OTHER CHARACTERISTICS
BD297	30 to 500	50	- connections Ø 5 mm for PVC pipe - with 2mtube and bracket for wall mounting

Flow Switches

Series Y100 - Paddle type - Y102 IP55; Y103 IP45 SPDT 15 (8) A-230 V a.c.

MODEL	RANGE	OTHER CHARACTERISTICS
Y102	1 to 85 m ³ /h	for liquids - 1" screwed connections for pipes Ø 1" to 8"
Y103	1 to 5 m/s	for air - complete with mounting flange - paddle 175 x 80

Level Controllers

Series FG600 - Float-type - AISI 304 stainless steel - Flanged connections - SPDT 10 (1) A-24 V a.c. - Industrial water-proof case - IP55

MODEL	MAX WORKING PRESSURE kPa	DIFFERENTIAL mm	MAX WORKING TEMPERATURE °C	OTHER CHARACTERISTICS
FG601	1600	15 to 60	200	cast-iron body - connections 20 mm
FG603	3000	25 to 60	230	stainless steel body connections 20 mm
FG604	3000	25 to 60	230	as above with level sight glass





300 Line Balance Potentiometer Proportional Control

GENERAL INFORMATION

Controllers

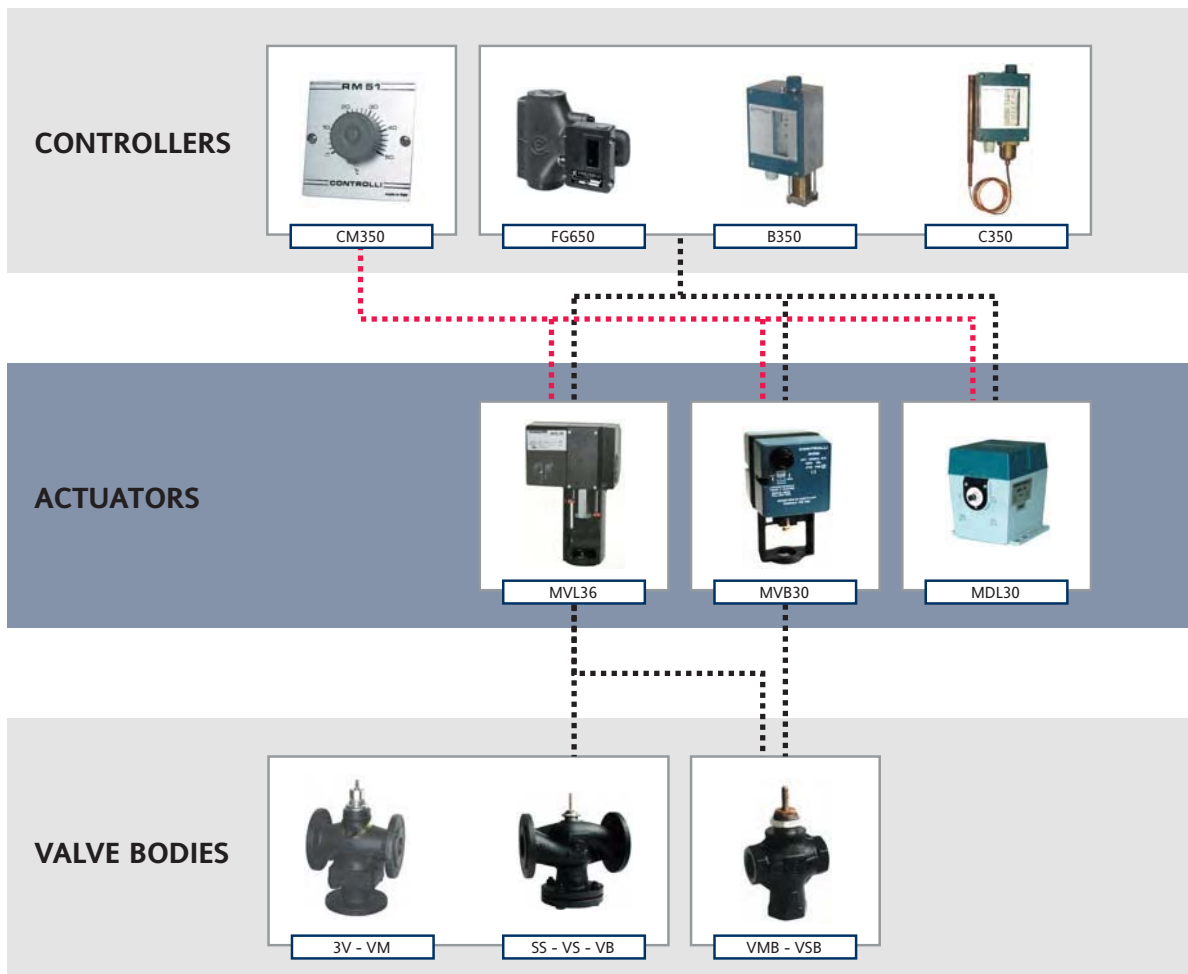
Line 300 controllers are equipped with a linear potentiometer device, with an output signal which can assume any value between 0 and 165 Ohm.

Each variation of the controlled variable within the range of the proportional band, corresponds to a specific ohmic value from the controller and to the relevant position of the end device detected by the balance potentiometer.

Controlled devices

The suitable controlled devices are bidirectional actuators fitted with electronic card and 300 Ohm balance potentiometer: MDL30 for dampers, MVB36 - MVL36 for globe valves.

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Bulb Thermostats

Series C350 - Steam filled sensing element - 165 Ohm potentiometer - Die-cast aluminium case IP 55.

MODEL	RANGE °C	PROPORTIONAL BAND K	MAX SAFE TEMPERATURE °C	OTHER CHARACTERISTICS
C357	20 to 70	"	85	copper bulb and capillary 2 m long
C359	95 to 140	"	155	"

Accessories for C300.

MODEL	CHARACTERISTICS
G1	copper well 3/4" gas - 180 mm long
R1	brass gland nut 3/4" gas with packing

Pressure Switches

Series B350 - Metal bellows sensing element - 165 Ohm potentiometer - Die-cast aluminium case IP 55.

MODEL	RANGE kPa	PROPORTIONAL BAND kPa	MAX SAFE PRESSURE kPa	OTHER CHARACTERISTICS
B351	10 to 200	25 to 100	600	copper alloy bellows
B352	100 to 600	35 to 350	900	"
B353	200 to 1400	150 to 900	2200	"
B354	500 to 3000	120 to 900	3800	"
B351X	10 to 200	25 to 100	600	AISI 316 stainless steel bellows
B352X	100 to 600	35 to 350	900	"
B353X	200 to 1400	150 to 900	2200	"
B354X	500 to 3000	120 to 900	3800	"

Level Controllers

Series FG650-AISI 304 stainless steel float - Flanged connections - 165 Ohm potentiometer - industrial water-proof case.

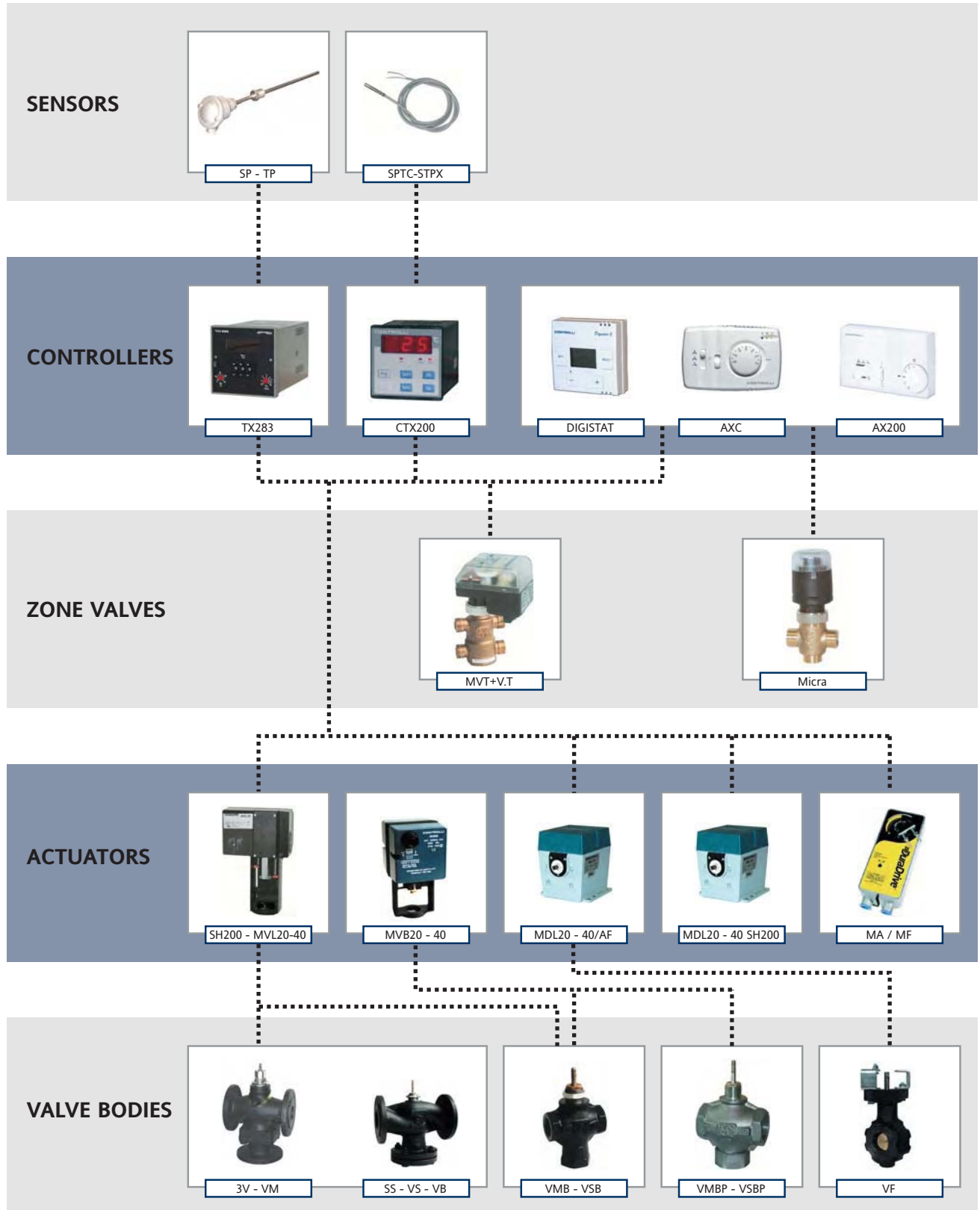
MODEL	RANGE kPa	PROPORTIONAL BAND mm	MAX SAFE PRESSURE kPa	OTHER CHARACTERISTICS
FG651	1600	60	200	cast-iron body-connections 20 mm
FG653	3000	60	230	cast-steel body-connections 20 mm
FG654	3000	60	230	as above with level sight glass





200 Line On-Off / Floating Control (General Information see page 4)

BASIC SYSTEM

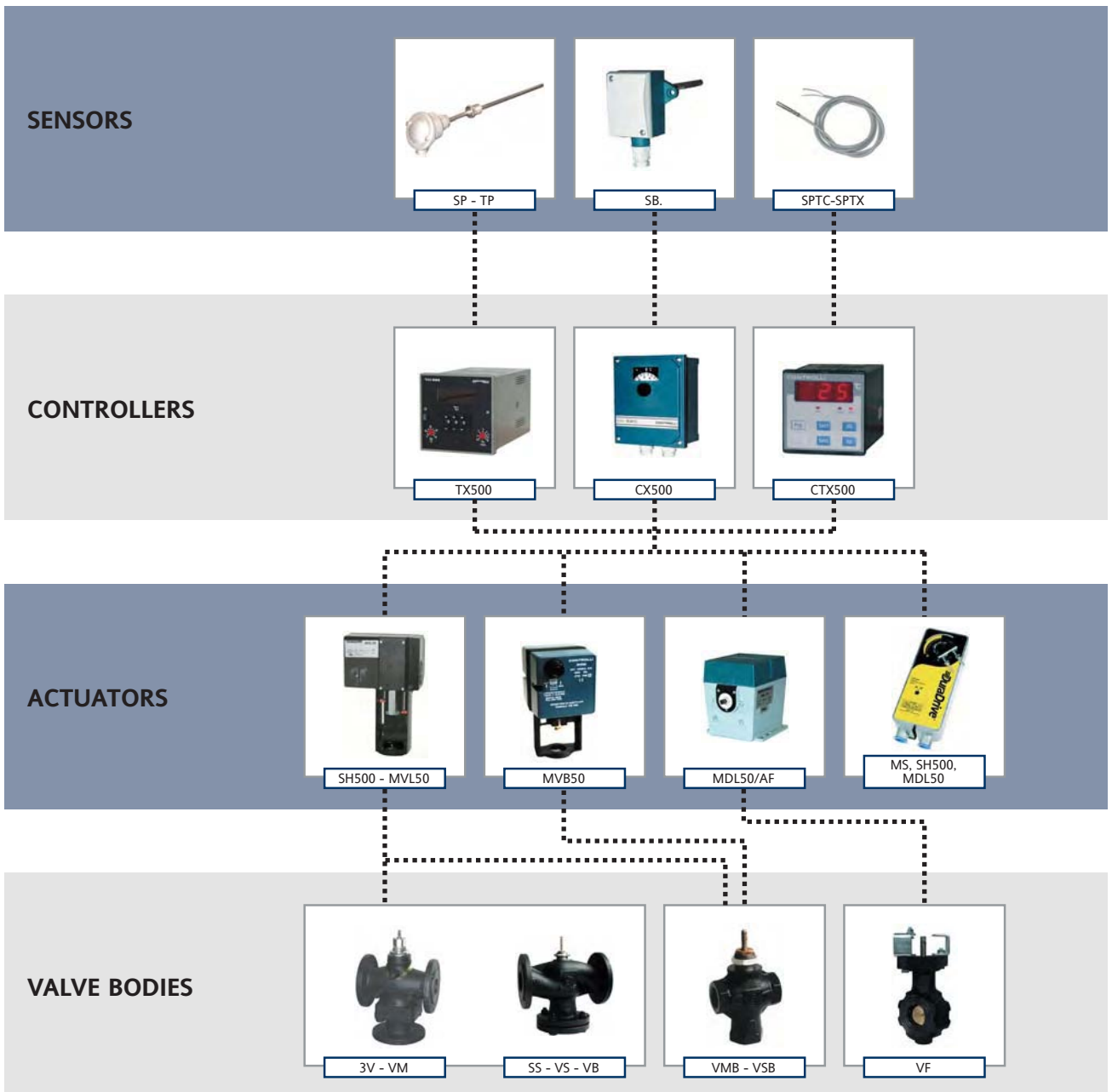


systems and controls for heating A/C plants and industrial processes

500 Line V d.c. Output Proportional Control (General Information see page 15)

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systems and controls for heating and air conditioning

200 Line



Room Thermostat

Series AX200 - Thermistor sensing element - Supply 230 V a.c.

MODEL	RANGE °C	DIFFERENTIAL K	OTHER CHARACTERISTICS
AX236	5÷30	hysteresis 0,5K	on/off, 3 fan speed control

Fan-coil Electronic Controllers

AXC series - Periodic ventilation, valve protection, set point limit, led indication (Heating/ Cooling/on), hot start (timer), periodic valve opening, Economy switch (on request), 3 fan speed selector, water sensor input, window contact input, automatic changeover, electric heater. IP30 protection, power supply 230Vac, 50/60Hz.

MODEL	CHARACTERISTICS
AXCU22/W	controller for 2/4-pipe fan coils
AXCU22/WMB	as above with ModBus protocol ModBus

Accessories for AXC ModBus Version

MODEL	CHARACTERISTICS
AXCU/BA	Bus Adapter for AXCU22/WMB

Water and Air sensors for AXC Controllers.

Input ST2 can be connected to NTC sensor (additional to internal sensor: by a dip switch it is possible to choose which one to use) installed on the return air flow. Input ST3 can be connected to NTC sensor to measure the water temperature (to be mounted downstream the valve). This sensor is used to acknowledge operation.

MODEL	OTHER CHARACTERISTICS
SNTC	Temperature sensor, ABS cap, PVC cable, range - 30..80°C, cable length 1,5 m.
SNTC-S	Temperature sensor, AISI 304 steel cap, silicon cable, range - 50..110°C, cable length 1,5 m.

Room Chronothermostat

Series DIGISTAT - Thermistor sensing element.

MODEL	RANGE C°	DIFFERENTIAL K	OTHER CHARACTERISTICS
DIGISTAT 3	5 to 30	0.6	1 SPDT 2(1) A-240 V a.c. - supply by built-in battery 1,5 (2 wire connections)

Temperature Controllers

Series CTX - Electronic with 1-relay, 2-relay, 2-relay +0÷10V action. Dimensions 72x72x102mm, panel mounting (cut-out 67x67mm). SPTC sensors see page 38.

MODEL	OUTPUT	INPUT	POWER SUPPLY
CTX131	1-relay	PTC	230
CTX141	1-relay	PTC	24
CTX231	2-relay	PTC	230
CTX241	2-relay	PTC	24
CTX531	2-relay + 0÷10 V	PTC	230
CTX541	2-relay + 0÷10 V	PTC	24
CTX132	1-relay	Pt100	230
CTX142	1-relay	Pt100	24
CTX232	2-relay	Pt100	230
CTX242	2-relay	Pt100	24
CTX532	2-relay + 0÷10 V	Pt100	230
CTX532A	2-relay + 0÷10 V+ dead zone+4-20mA	Pt100	230
CTX542	2-relay + 0÷10 V	Pt100	24
CTX133	1-relay	4÷20 mA	230
CTX143	1-relay	4÷20 mA	24
CTX233	2-relay	4÷20 mA	230
CTX243	2-relay	4÷20 mA	24
CTX533	2-relay + 0÷10 V	4÷20 mA	230
CTX532A	2-relay + 0÷10 V+4-20mA, PID action	4÷20 mA	230
CTX543	2-relay + 0÷10 V	4÷20 mA	24

Series CX500 - Proportional - Integral - Derivative (PID), changeable on field into Proportional - Direct/reverse action - Power supply directly from MVB-SH-MDL-MVL actuator - Sensing element: see SB sensors, page 38.

MODEL	RANGE C°	PROPORT. BAND K	INTEGRATION TIME Tn (s)	DERIVATIVE TIME TD	MOUNTING
CX528	-10 to 120 °C	2 to 40	16 to 600	¼ Tn	wall or flush

Series TX200 - Floating-type - Drive and alarm relay circuits 2 (0.5) A-24 V a.c. - Power supply 24 V a.c. - Sensing element: see SP - TP sensors - Flush mounting.

MODEL	DRIVE CIRCUIT		ALARM CIRCUIT		OTHER CHARACTERISTICS
	RANGE C°	DIFFERENTIAL K	RANGE C°	DIFFERENTIAL K	
TX283	-30 to 400	2 to 20 to set-point	± 30 respect	2	3-point digital type

Series TX500 - Proportional - Integral - Derivative (PID), changeable into Proportional on field - Direct/reverse action - Supply 24 V a.c. - Flush mounting - Sensing element: see SP - TP sensors. IP40 protection

MODEL	RANGE C°	PROPORT. BAND K	INTEGRATION TIME Tn (s)	DERIVATIVE TIME Tv	OTHER CHARACTERISTICS
TX581	-30 to 400 °C	2 to 40	20 to 600	1/8 Tn	digital set and temperature indication
TX586	0 to 399 °C	2 to 40	20 to 600	1/4 Tn	digital set and temperature indication

Sensors for TX500 and CTX (Pt100) - Sensing element: Platinum (100 Ohm at 0°C)

MODEL	CHARACTERISTICS
SPC	immersion - AISI 304 well, 1/2" gas connection - conduit opening Ø 10 mm, 113 mm long, max fluid temperature: 150 °C
TPC	immersion - 1/2" gas AISI 304 well-conduit opening Ø 10 mm 200 mm long, max fluid temperature: 500 °C
421	option for SPC: AISI 304 stainless steel well and connection

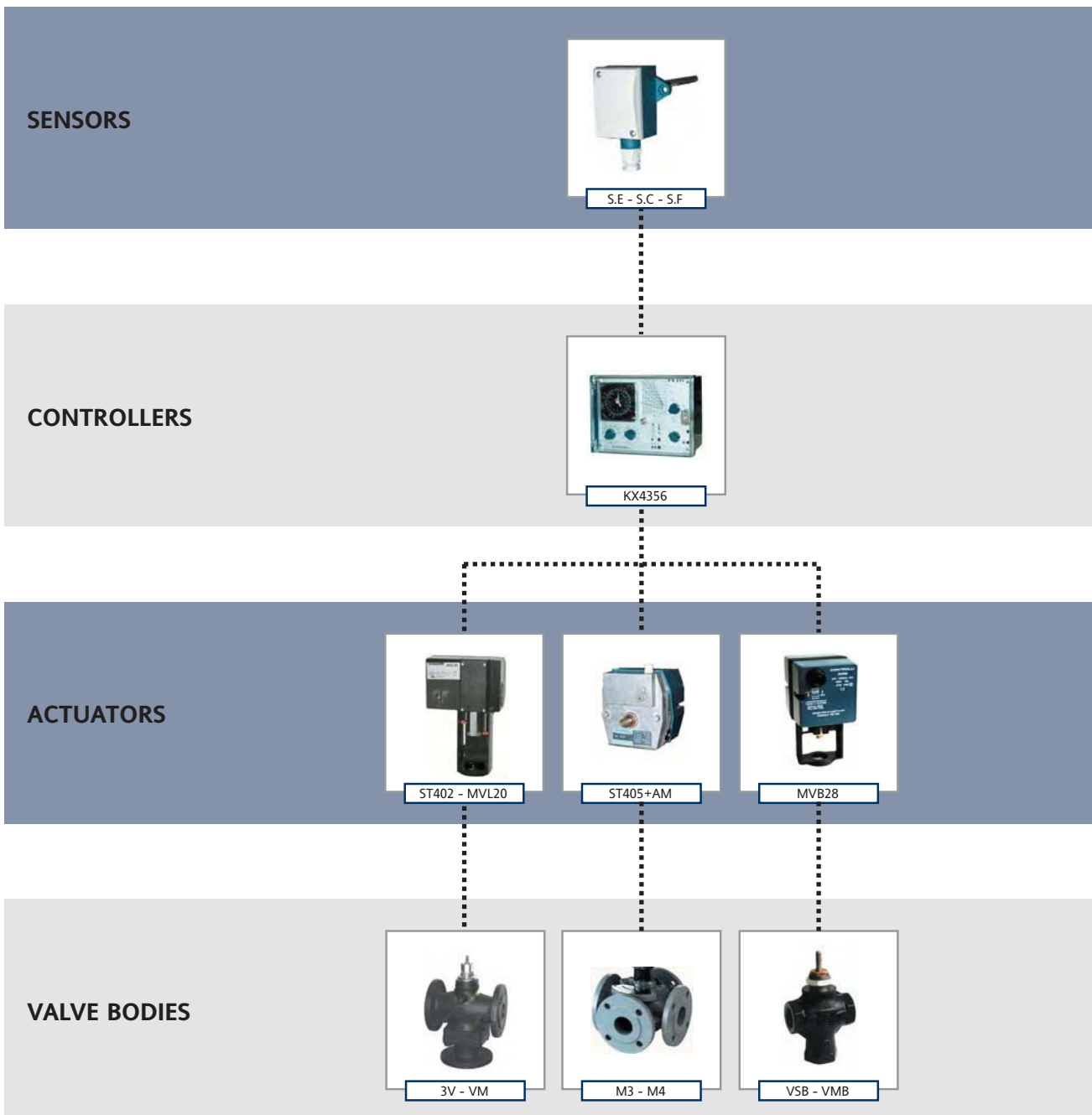




400 Line Time Proportional Control

GENERAL INFORMATION 400 line controllers are electronic type with integrated circuit with two-relay floating output signal. Signals are activated as proportional impulses, whose duration is proportional to the difference of the controlled variable temperature with respect to the set value. These controllers are equipped with two sensing elements (supply sensor and outside sensor) and they control hot water supply temperature in function of outdoor temperature value, according to a pre-set slope. Suitable field devices are globe valves motorized by MVB2.-MVL2. and ST402 actuators and shoe valves motorized by ST405.

B A S I C S Y S T E M



systems and controls for heating, A/C plants and industrial processes

400 Line

Climatic Controllers

Series KX400 - For supply water with outside compensation - Slope 0.5 to 3.5 - Power supply 230 Vac - IP40 protection - Balco sensing element. KX control valves motorized by MVB28, MVT4, see page 42, and ST402-405.

MODEL	OTHER CHARACTERISTICS
KX436G	daily time switch with spring reserve -7 programme selector knob pump control circuit - SB sensors
KX436S	as above - with weekly time switch with spring reserve

Accessories

MODEL	OTHER CHARACTERISTICS
F1	flush mounting bracket

Temperature Sensors

SB... Balco 1000 Ohm 21,1°C sensing element - for KX436 controllers

MODEL	OTHER CHARACTERISTICS
SBC	immersion - AISI 304 stainless steel well- 1/2" gas nickel-plated brass connection length 113 mm - PG9 cable sleeve - max fluid temp.: 140°C - IP44
SBE	outside - PG9 cable sleeve - IP44
SBF	strap-on (immersion) - IP44
421	sheath for SBC with AISI 304 stainless steel connection



air conditioning systems and controls



500 Line V d.c. Output Proportional Control

GENERAL INFORMATION

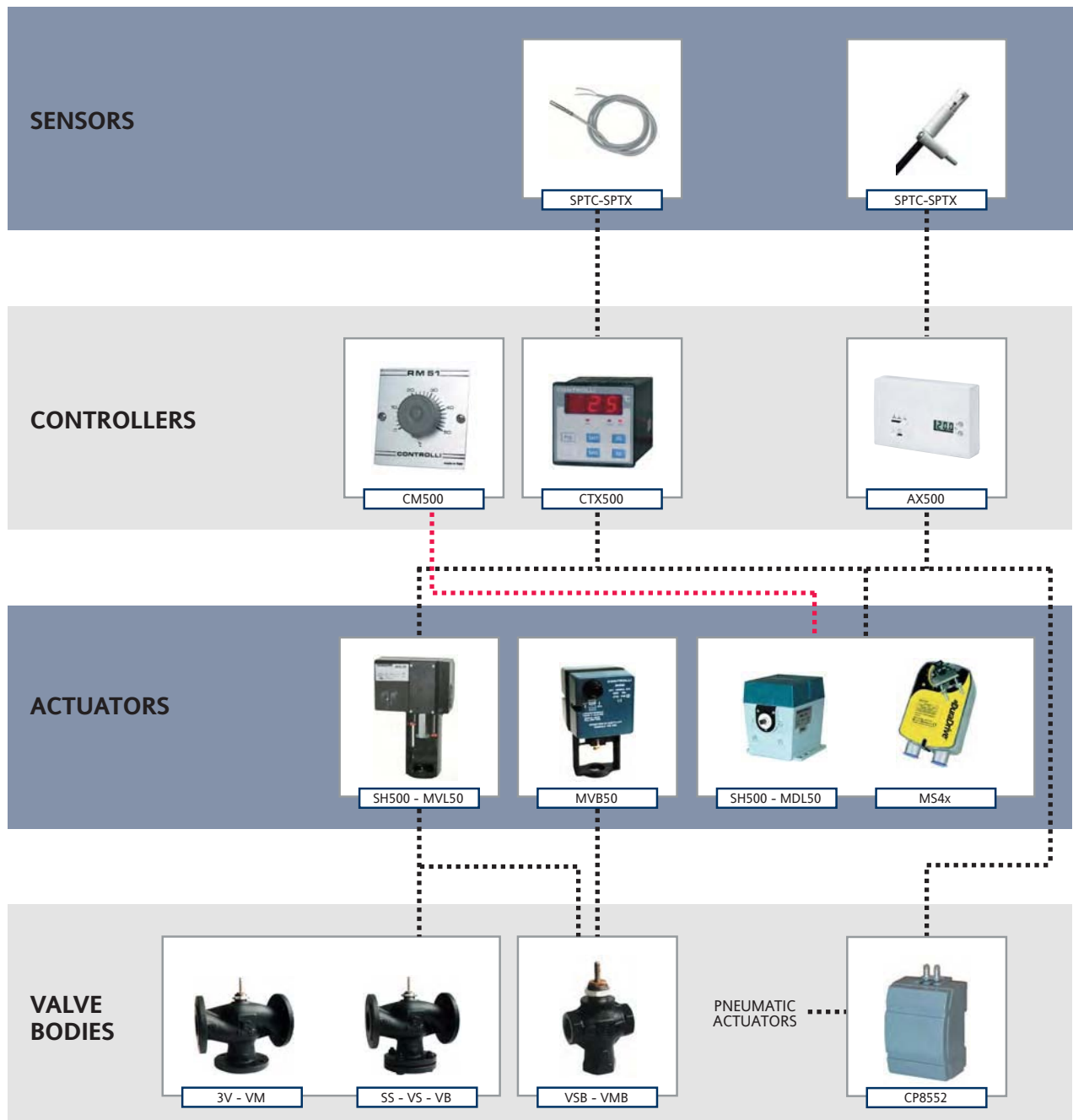
AX - CX - CTX - TX - Omnia controllers

Hybrid and integrated electronic circuit type with Vdc output signal and P (AX500, CTX500, Omnia) or PID (CX) action. Each variation of the controlled variable, included in the proportional band range, corresponds to a specific voltage value from the controller. The final control element position, determined by the potentiometer, will be proportional to the controller output signal, thus ensuring the system accuracy and stability. The compatible final elements or field devices are MS41, SH525, MDB and MDL5. damper actuators and MVB5., SH522, MVL5. and MVT5. valve actuators.

Auxiliaries

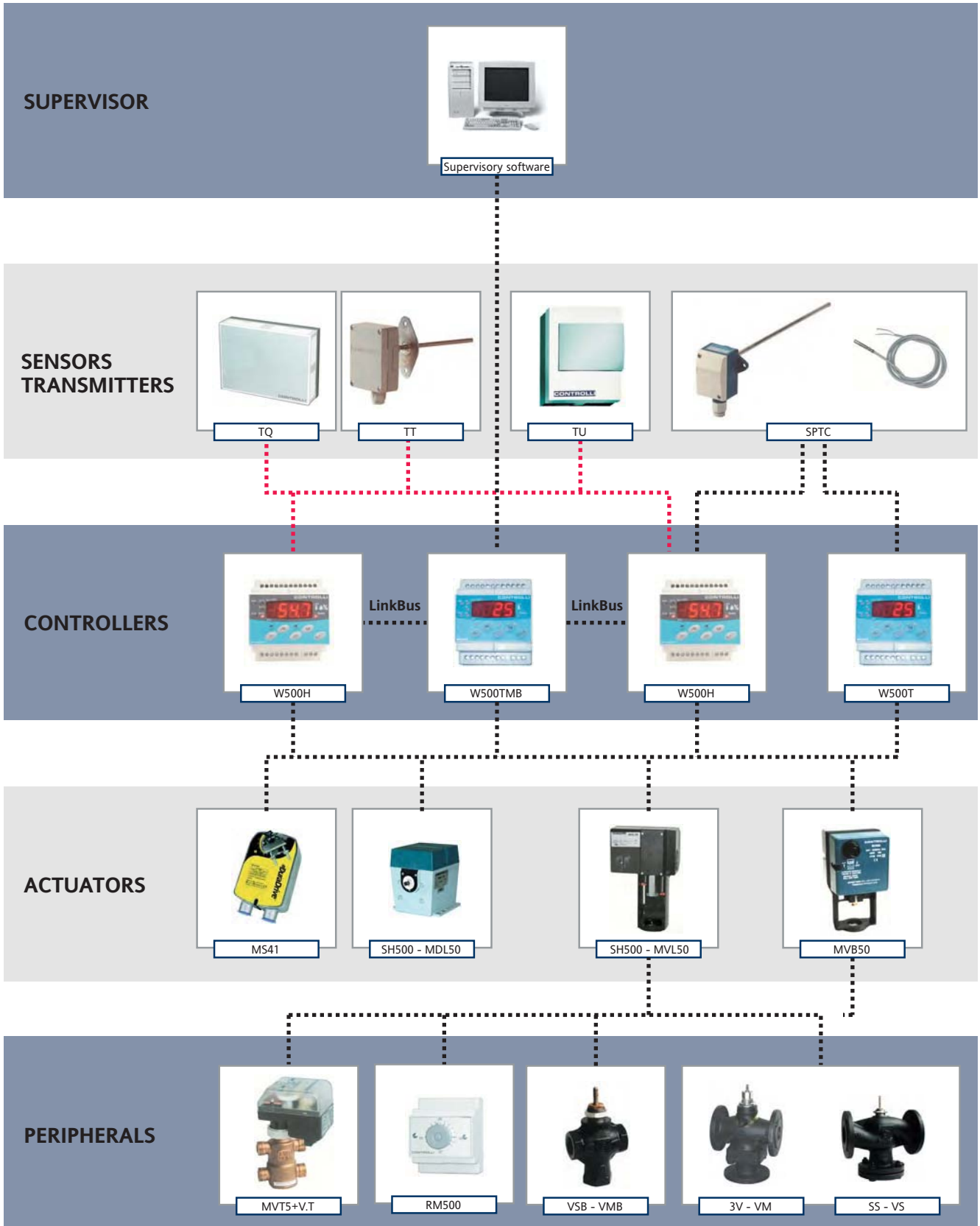
This line provides a wide range of transducers and auxiliary modules which allow accomplishing several complex technical solutions.

BASIC SYSTEM



500 Line V d.c. Output Proportional Control

BASIC SYSTEM



air conditioning systems and controls

500 Line



DDC Temperature Controllers

Omnia series - PTC sensing element. Supply 230 Vca - I Data exchange through LinkBus - ModBus capability - IP30 protection - Dimensions 70X85X61 mm.

MODEL	CHARACTERISTICS
W500T	Digital temperature controller. P, P+I control, limit and compensation functions. 2 analogue 0÷10 Vdc outputs and 2 relay outputs.. 3 ½-digit display. DIN.rail mounting
W500TMB	As above with RTC clock and ModBus connectivity
W501TMB	As W500TMB with application-specific default values and 3-position output

DDC Temperature, Humidity and Enthaply Controllers

Omnia series - PTC sensing element. Supply 230 Vca - Data exchange through LinkBus - ModBus capability - IP30 protection - Dimensions 70X85X61 mm.

MODEL	CHARACTERISTICS
W500H	Digital temperature and humidity controller. P, P+I control, limit and compensation functions. 2 analogue 0÷10 Vdc outputs and 2 relay outputs.. 3 ½-digit display. DIN rail mounting
W500HMB	As above with RTC clock and ModBus connectivity

Accessories for Omnia Controllers

MODEL	CHARACTERISTICS
RM500	Remote positioner for Omnia controllers, working range 5÷35 °C
RM510	Remote positioner for W500H/HMB controllers, working range 0÷100%

Temperature Sensors

PTC (SPTC) and PT100 sensing element (SPTX-U only) for Omnia controllers

MODEL	OTHER CHARACTERISTICS
SPTC-A	room sensor (dimensions 86x86x31 mm) - IP30
SPTC-A5	room sensor with set point adjustment (dimensions 86x86x31 mm) - IP30
SPTC-C	immersion sensor cable type (provide a well), 1,5 m silicone cable
SPTC-CR	immersion sensor with case and stick enclosed
SPTC-D	duct sensor cable type (provide a well), 1,5 m silicone cable
SPTC-E	outside sensor - IP44
SPTC-F	strap-on pipe sensor - IP44
SPTC-V	as SPTC-D but with case and stick enclosed - IP44

air conditioning systems and controls

500 Line

Room Thermostats

Series AX500. Internal NTC sensing element - Supply 24 V a.c - IP30 protection - Optional external temperature sensor STR73, see page 38.

MODEL	RANGE °C	DEAD ZONE K	OTHER CHARACTERISTICS
AX526	5 to 30	0,5 to 7,5	2 outputs 0 to 10 Vdc
AX527	5 to 30	0,5 to 7,5	As AX526 with on/off switch and 3 speed fan
AX536	5 to 30	0,5 to 7,5	2 outputs 0 to 10 Vdc with on/off electric heater output and LCD display
AX537	5 to 30	0,5 to 7,5	As AX536 with on/off switch and 3 speed fan

Electronic-Pneumatic Transducers

Series CP8500 - Output signal 3 to 13 psi - Air supply 20 psi max - Rating 540 l/h - Consumption 500 NL/h.

MODEL	INPUT SIGNAL		ACTION	SUPPLY	OTHER CHARACTERISTICS
	V d.c.	mA			
CP8551		4 to 20	direct	from actuator	panel mounting
CP8552	6 to 9, 0 to 10	4 to 20	direct	24 V a.c.	

Signal Transducers

Series IZ - Supply 24 V a.c. - Mounting on track size 35 mm DIN 46277/3

MODEL	OTHER CHARACTERISTICS
IZA	input 3 to 12 V d.c. - output 12 to 3 V d.c.
IZB	input from SB sensors - output 0 to 10 V d.c.
IZV	input 4 to 7; 6 to 9; 8 to 11; 0 to 10 V d.c. - output 4 to 20 mA

Remote Positioners

Series CM500 - Remote manual potentiometer to drive 500 Line actuators - Flush mounting. IP30 protection.

MODEL	RANGE	OTHER CHARACTERISTICS
CM511	0 to 10	range 6 to 9 V d.c.

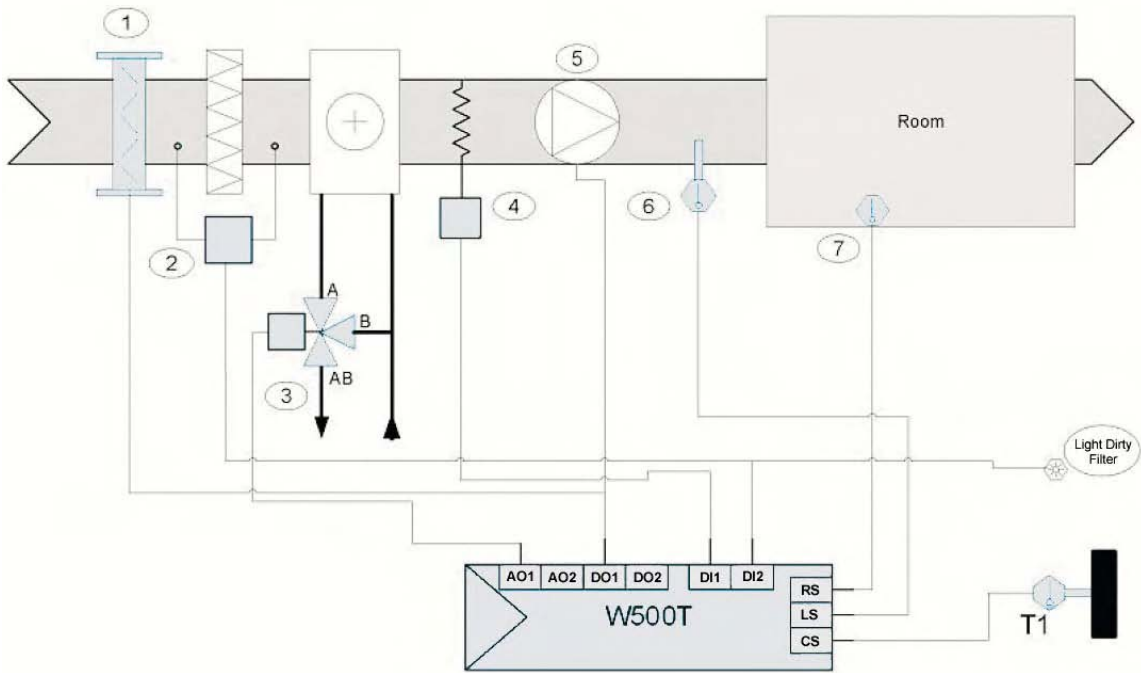
Power Pack

MODEL	OTHER CHARACTERISTICS
TL51	24 Vac input, 15 Vdc - power pack for 500 Line controllers (CX, CM511, TX) driving actuators without 15Vdc (MVT56, MS41-7153-G02). Wall mounting. Dimensions 85x55x32 mm

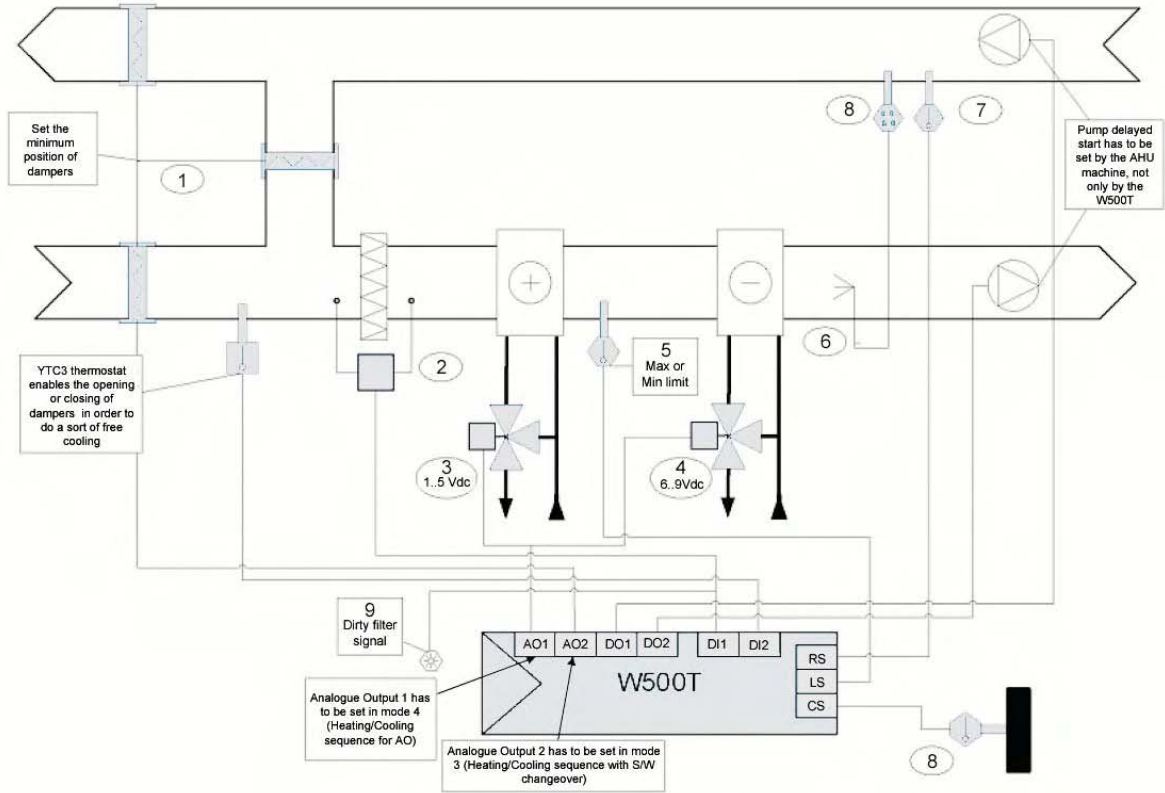


application examples with Omnia controllers

Main Air Conditioning

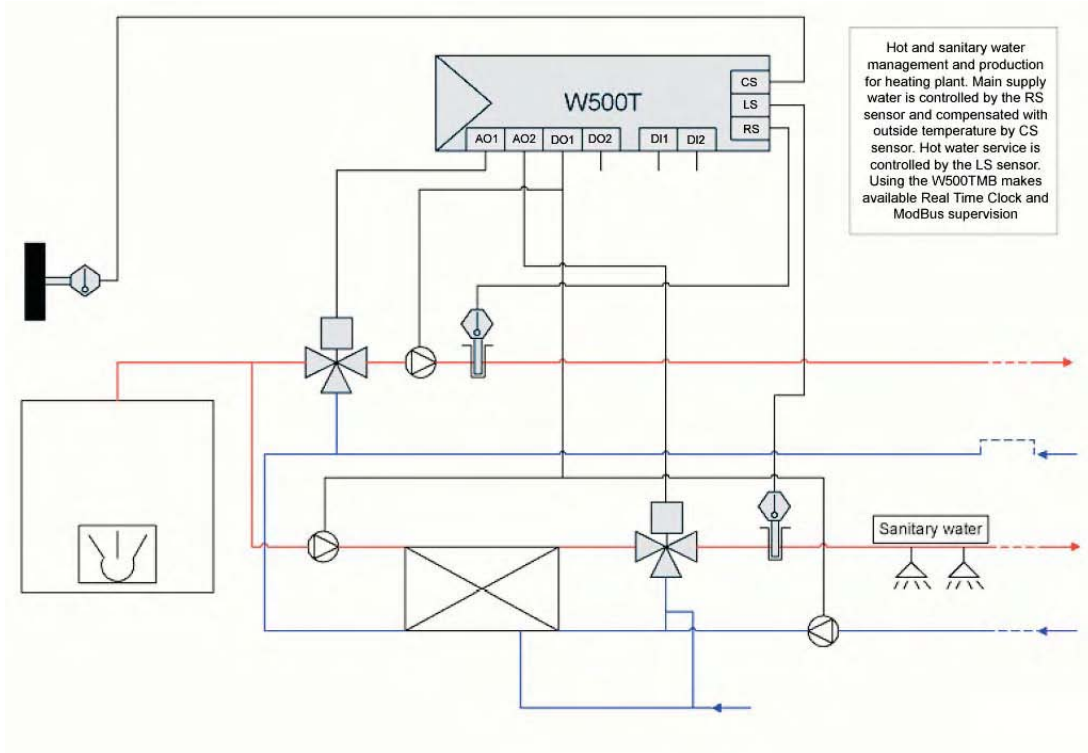


Air Handling Unit at Constant Flow

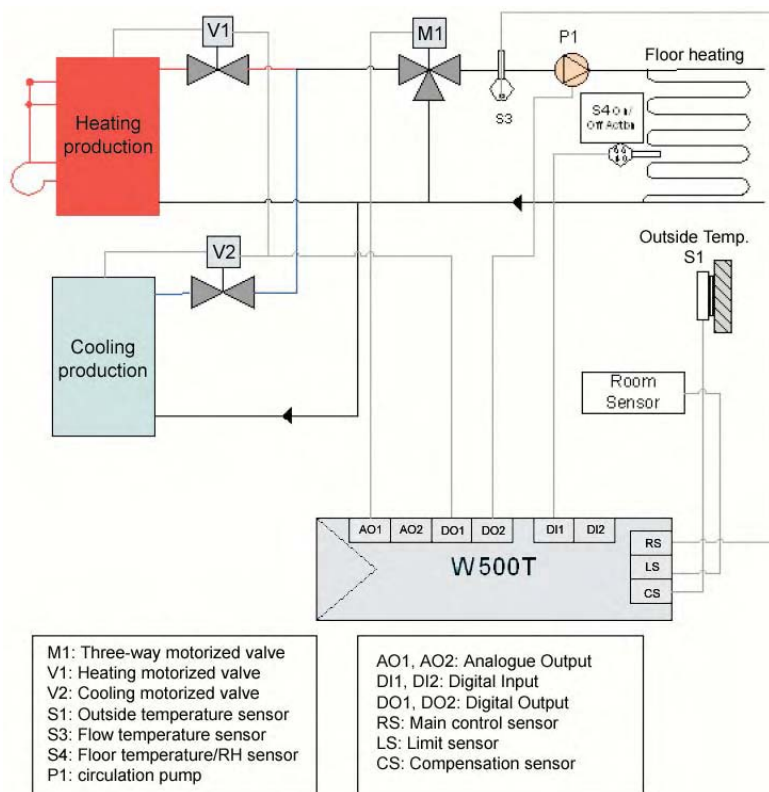


application examples with Omnia controllers

Heating and Hot Water Service

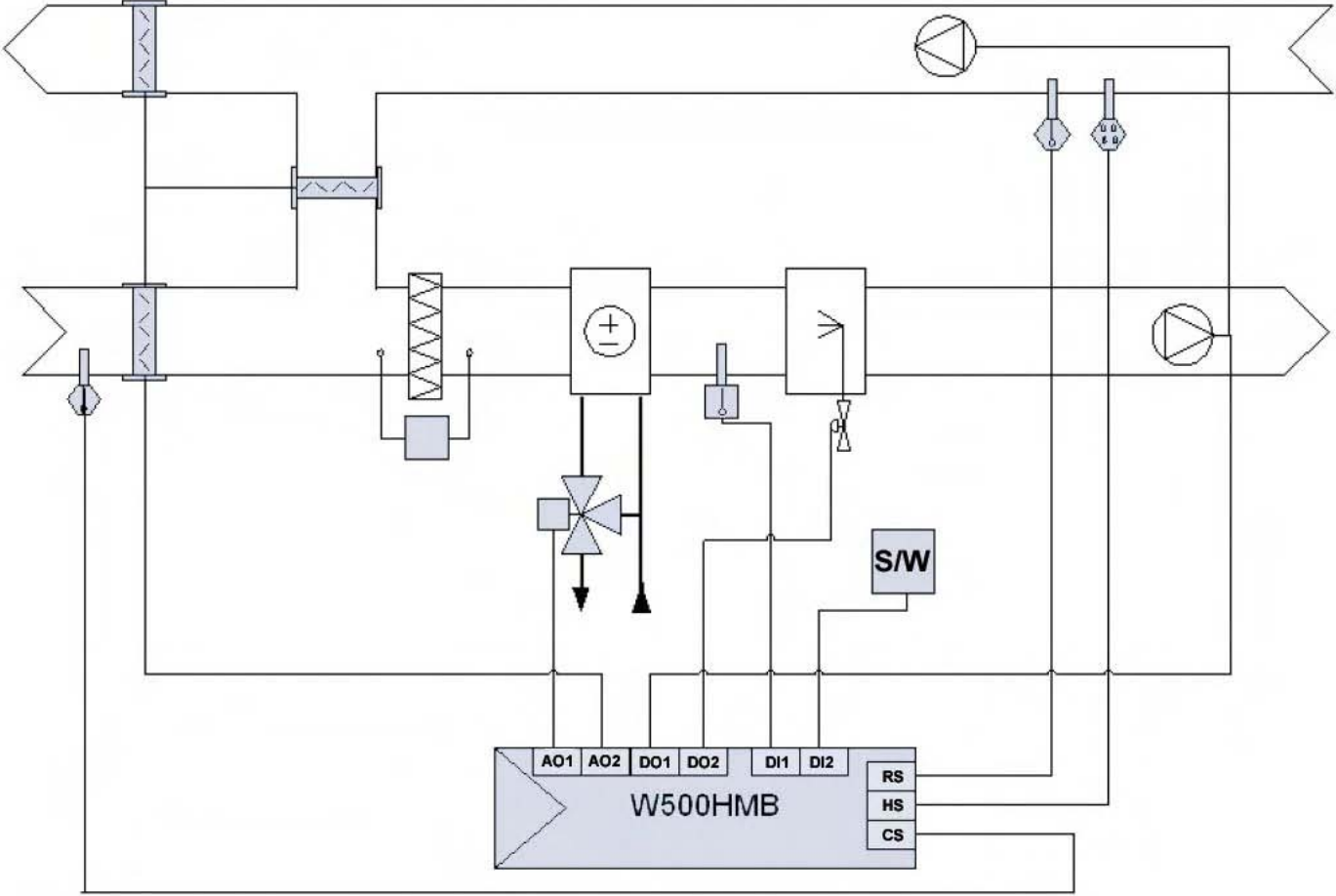


Floor Heating and Cooling



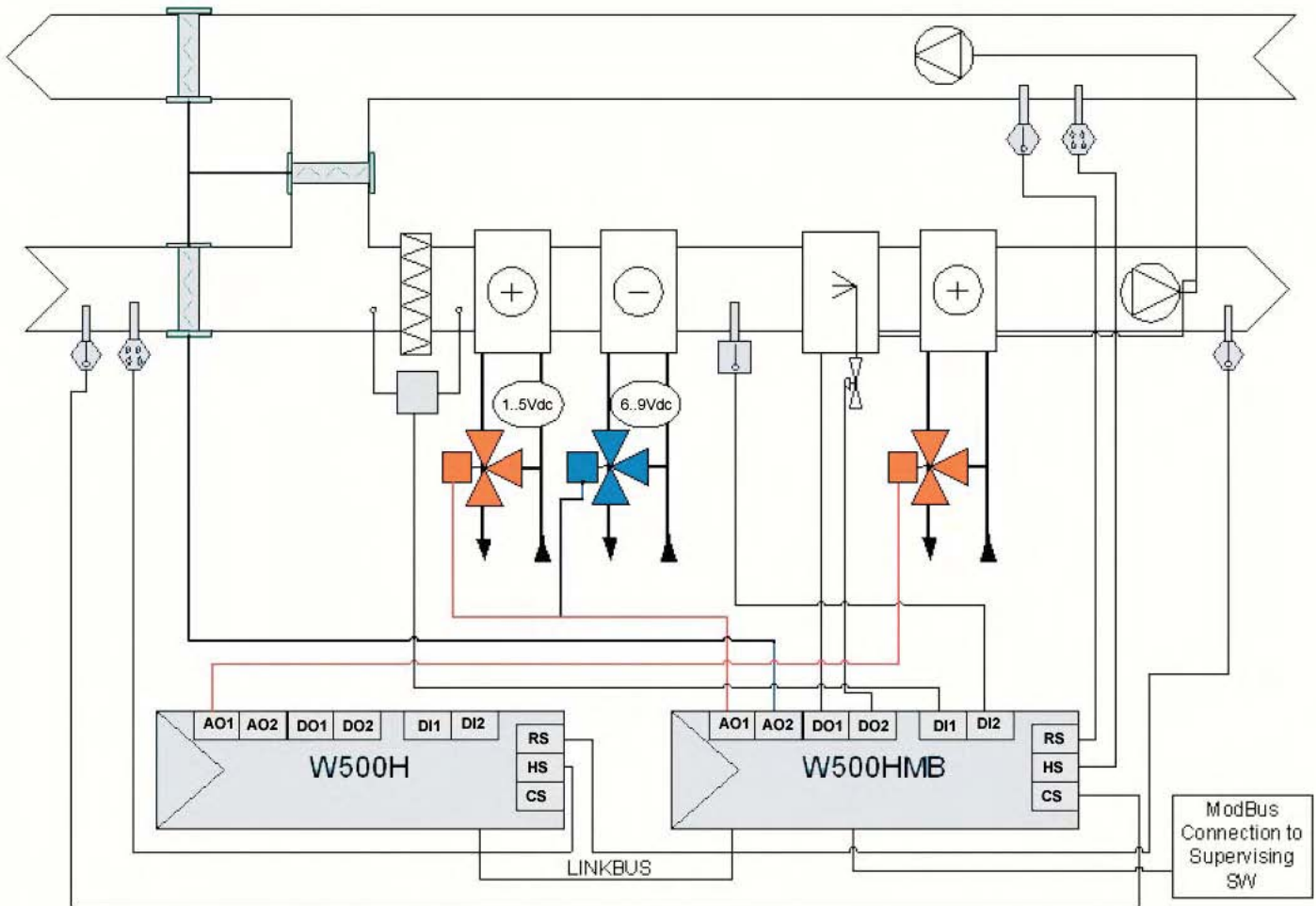
application examples with Omnia controllers

Temperature, Humidity and Enthalpy Control



application examples with Omnia controllers

Free Cooling



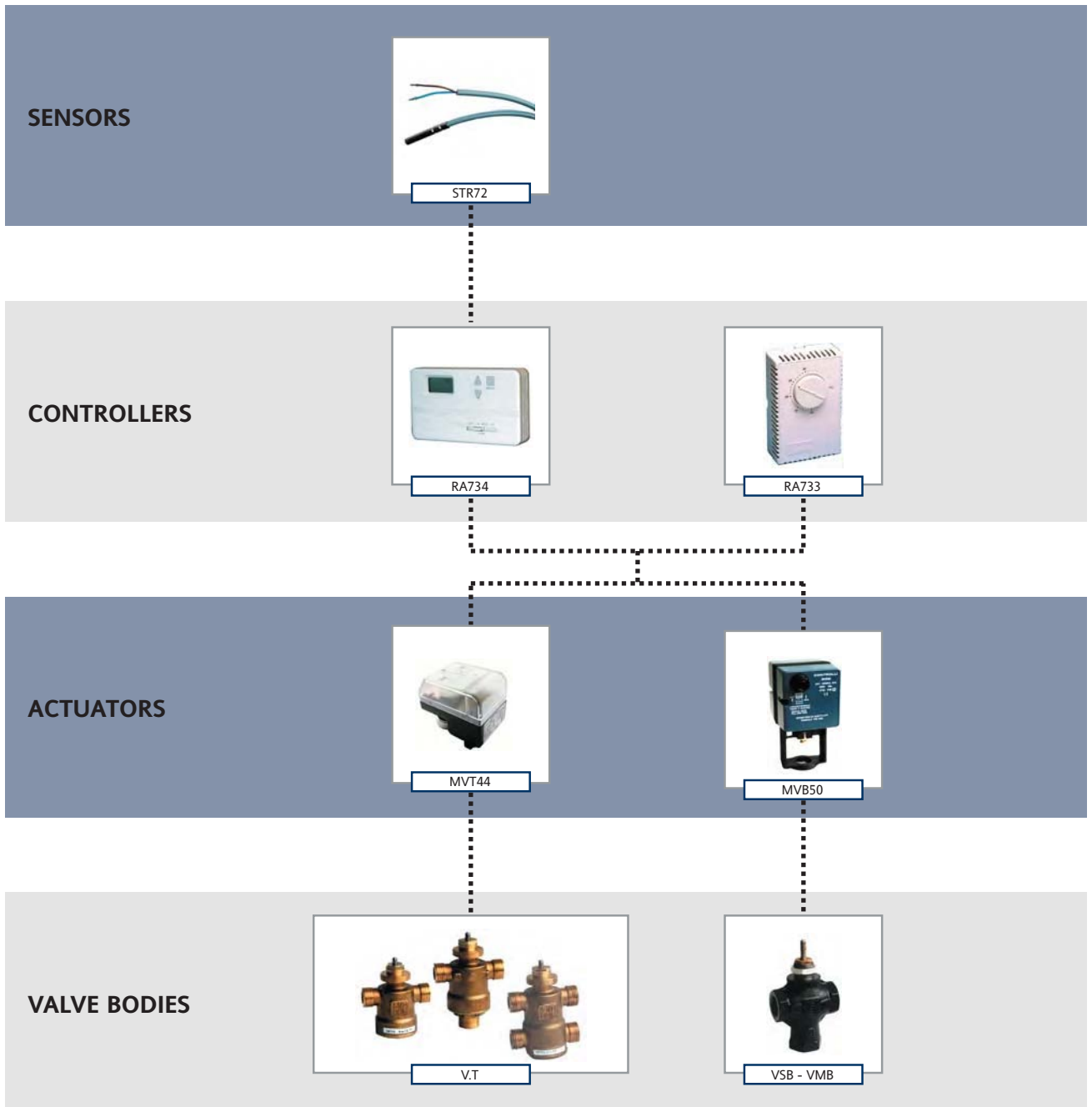


700 Line: Microprocessor Floating Control

GENERAL INFORMATION

The RA730 microprocessor controllers drive, with floating (PI) action, 24 Vac bidirectional actuators. The controllers have a built-in sensor, but they can be connected to an external return sensor. The typical application for such controllers is to drive V.T/MVT4 motorized valves in two- or four-pipe terminal units, but they can also be used to control V.B/MVB46 motorized valves in AHU re-heat coils.

B A S I C S Y S T E M



fan-coil unit systems

700 Line

Room Temperature Microprocessor Controllers

Series RA730 - Floating action for driving bidirectional actuator MVT44/V.T, see page 42-46. Built-in NTC sensor, RA734 only, external sensor on return - RA733 manual set point adjustment. RA734 display for temperature and set point reading, 3 fan speed selector and switch. Supply 24 V a.c. Wall mounting. IP30 protection.

MODEL	RANGE °C	ACTION	OTHER CHARACTERISTICS
RA733	0 to 35	heating or cooling	for 2-pipe terminal (1 V.T/MVT4 valve) centralized summer/winter changeover
RA734	5 to 32	heating-cooling in sequence	for two- and four pipe terminals (1-2 V.T/MVT4 valves)

Return Temperature Sensor

Series STR - for RA734 - Sensing element NTC 10 Kohm, 25°C - IP20 protection

MODEL	OTHER CHARACTERISTICS
STR72	return air or duct sensor cable length 1,2 msupplied without mounting kit



fan-coil and vav control

DIGITROLL 7000

GENERAL INFORMATION

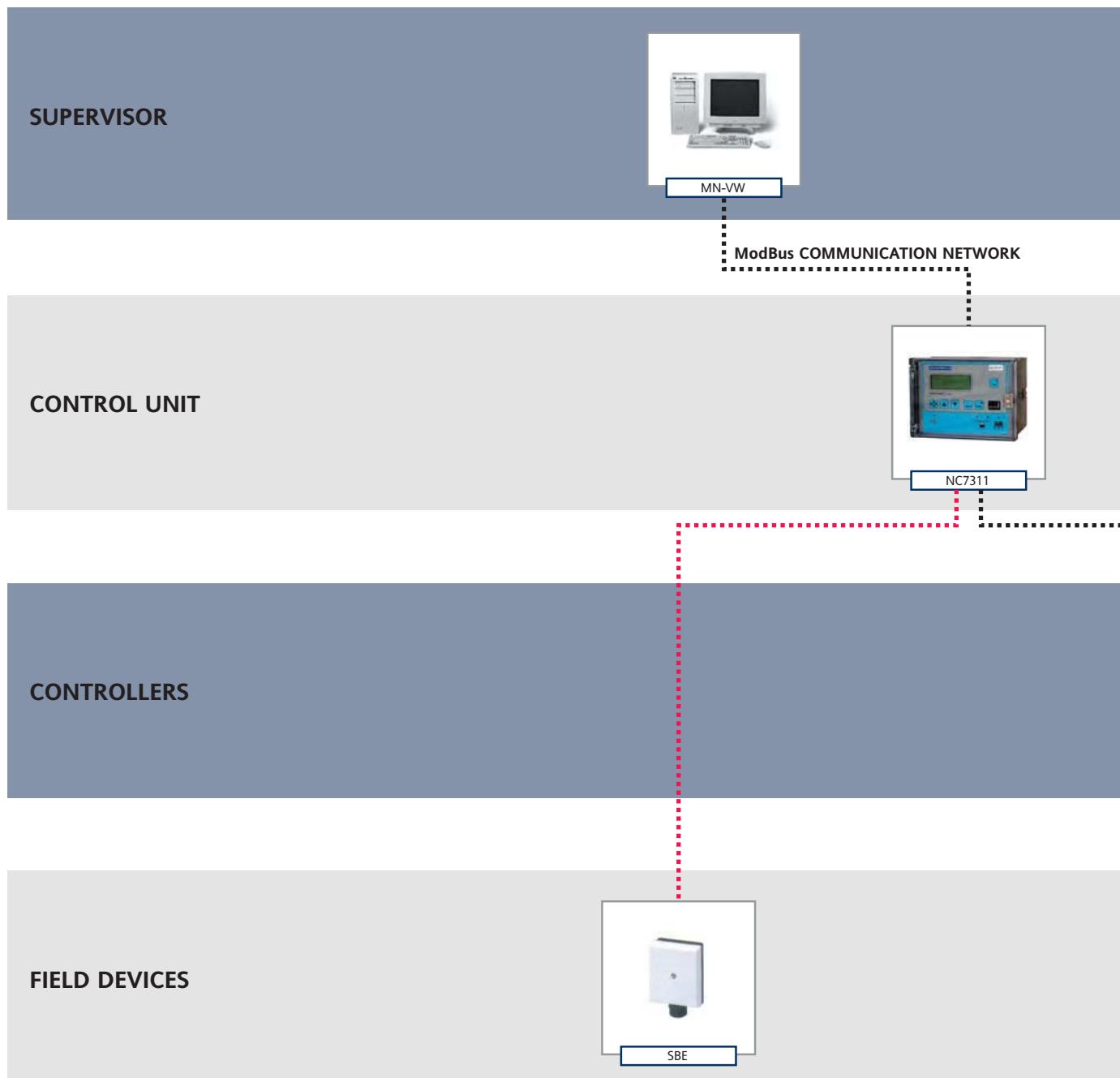
The NC700 microprocessor control unit includes a display and function keypad for setpoint adjustment, operating modes programming of the terminal unit controllers and central controllers recalibration.

The control unit can be connected to a communication network.

The controllers can operate stand-alone, if the control unit is absent. They control room temperature in 2 or 4-pipe fan coils; different versions are available for P+I control of Micra valves, V.ZB valves motorized by MVA4 or V.T valves motorized by MVT4. and, only in case of controllers with fan speed control, also with MVT5.-motorized valves.

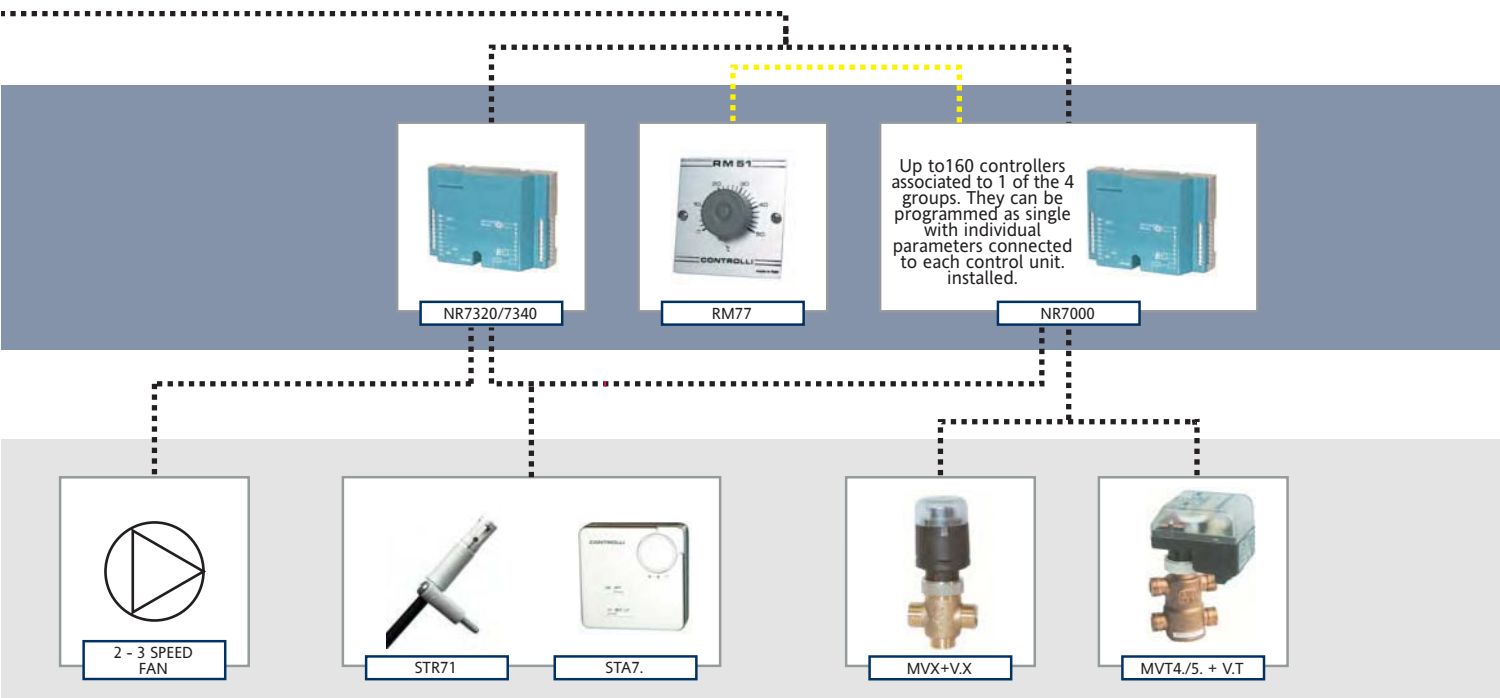
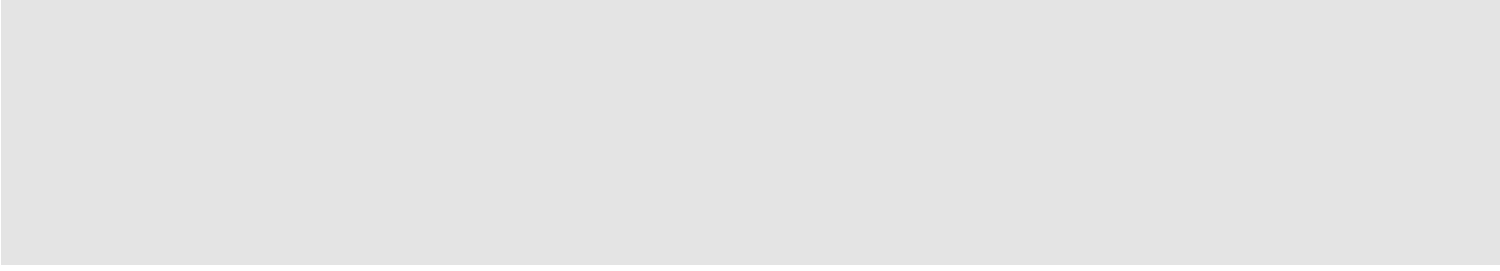
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fan-coil and vav control



fan-coil and vav control

DIGITROLL 7000



Control Unit

Series NC7000 - with LCD back-lighted display and key board for set point adjustment, programming of operating data and NR7000 controllers monitoring. Power supply 24 Va.c. - Wall or flush mounting. RS232 and RS485 communication network. IP20 protection.

MODEL	OTHER CHARACTERISTICS
NC7311MB2F	microprocessor control unit with ModBus protocol, connection to supervision system through RS232 - yearly program, summer-winter compensation. Language French/English
NC7311MB2I	microprocessor control unit with ModBus protocol, connection to supervision system through RS232 - yearly program, summer-winter compensation. Language Italian/English
NC7311MB4F	microprocessor control unit with ModBus protocol, connection to supervision system through RS485 - yearly program, summer-winter compensation. Language French/English
NC7311MB4I	microprocessor control unit with ModBus protocol, connection to supervision system through RS485 - yearly program, summer-winter compensation. Language Italian/English

Accessories

LIBO-4-485	RS232/485 opto-isolated converter
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Address Cards

Series NS - Plug-in electronic card for identification of each controller by Control Unit.

MODEL	OTHER CHARACTERISTICS
NS71	40-card package, numbered 1÷40
NS72	80-card package, numbered 1÷ 80
NS73	120-card package, numbered 1÷120
NS74	160-card package, numbered 1÷160



Remote Set Point

MODEL	OTHER CHARACTERISTICS
RM77	remote set-point adjuster ± 3 K - Flush mounting - IP30 protection
RMS77	as above with fan speed selector and on-off switch (dimensions 135 x 64 x 30 mm)

Interfaces

MODEL	OTHER CHARACTERISTICS
DG7ROUT1	Interface with conveyed waves bus, used as a repeater
DG7ROUT2	Interface with conveyed waves bus and RS485, used as bridge
DG7ROUT3	Interface with RS485 bus used as a repeater

Sensors

Series ST for temperature - Sensing element: NTC5000 Ohm at 20 °C for NR controllers.

MODEL	OTHER CHARACTERISTICS
STA71	room sensor (dimensions 85 x 55 x 32 mm)
STA75S	room sensor with ± 3 K set-point adjustment, dimensions 86x86x31 mm
STA80S	room with ± 3 K set-point and speed selector and on-off switch, dimensions 86x86x31 mm
STR71	return air duct with mounting kit

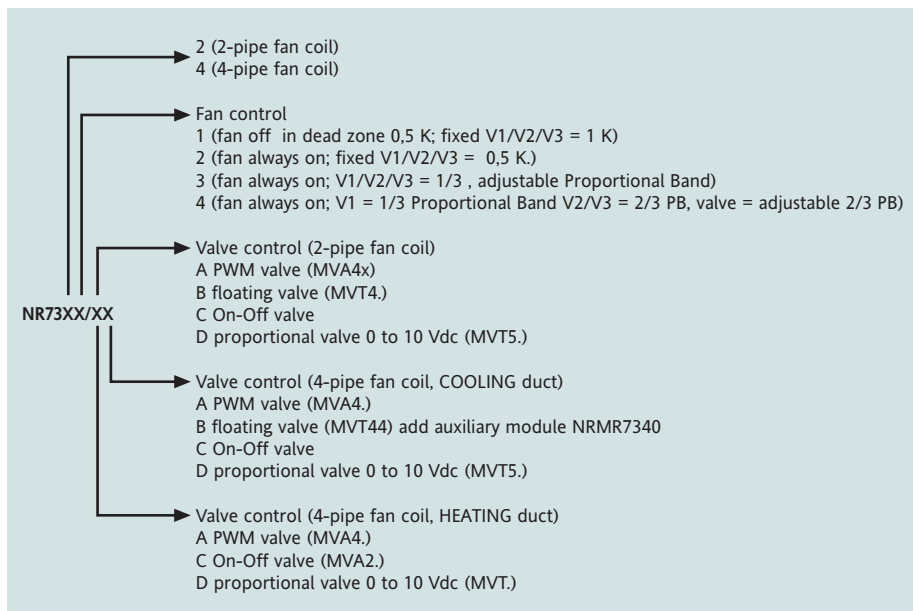
fan-coil and vav control

DIGITROLL 7000

Microprocessor Controllers

Series NR7000 - P+I action - All parameters set by Control Unit with possibility to operate stand-alone - Power supply 24 Vac - Installation on 35-mm rail (DIN 46277/3) - Sensing element: ST sensors.

MODEL	APPLICATION	OUTPUT	OTHER CHARACTERISTICS
NR7312	2-pipe fan-coil	1 PWM output	1 V.Z/MVA4 valve
NR7314	4-pipe fan-coil	2 PWM outputs	2 V.Z/MVA4. valves
NR7412	2-pipe fan-coil	1 floating output	1 V.T/MVT4. valve
NR7414	4-pipe fan-coil	2 floating outputs	2 V.T/MVT4. valves
NR7320BE	2-pipe fan-coil	3-stage on-off + electric battery + 1 PWM output	3 fan speed selector + 1 V.Z/MVA4. valve + electric battery
NR732xx	2-pipe fan-coil	3-stage on/off (Triac 24 Vac 4A) + 1 On-Off or PWM or floating (cooling only) or proportional valve	3 fan speed selector + 1 valve with MVA4 or MVT4. or MVT5. Please contact our Sales support for the selection of the model which suits the application
NR734xxx	4-pipe fan-coil	3-stage on/off (Triac 24 Vac 4A) + 2 On-Off or PWM or floating or proportional valves	3 fan speed selector+ 2 valves with MVA4 or MVT4. (only cooling) or MVT5. Please contact our Sales support for the selection of the model which suits the application



Microprocessor VAV Controllers

Series NR7515/17 - P + I action - All parameters set by Control Unit NC7000 with possibility to operate stand-alone - Power supply 24 V a.c. - Installation on 35-mm rail (DIN 46277/3) - Sensing element: ST sensors.

MODEL	APPLICATION	OUTPUT	OTHER CHARACTERISTICS
NR7515	VAV	2 outputs (0..10 Vdc, PWM)	air flow control and MVA4 valve control
NR7517	VAV	2 outputs (0..10 Vdc, floating)	air flow control and MVT4 valve control



Auxiliary Modules for Fan Speed Control

MODEL	APPLICATION	OUTPUT	OTHER CHARACTERISTICS
NRMR7340	with NR734XXB	3 stages relay 230 V ac	3 fan speed through NO 230 Vac relay contact
NRMR7340A	all except NR734XXB	3 stages relay 230 V ac	3 fan speed through NO 230 Vac relay contact

fan-coil and vav control

TERMINAL UNIT CONTROLS

SELECTION CHART FOR ROOM CONTROLLERS

CONTROLLER	SENSOR/SENSING ELEMENT	ACTION	S/W CHANGEOVER	SUMMER COMPENSATION
AS205	Built-in	on/off	On board	
AS206	Built-in	on/off	Centralized	
AS207	Built-in	on/off	On board	
AX236	Built-in	on/off	On board	
AXCU22/W	Built-in / SNTC-S	on/off	On board	
AXCU22/WMB	Built-in / SNTC-S	on/off	Centralized	via bus
AX526	Built-in / STR73	Prop. 0-10 Vdc	Centralized	
AX527	Built-in/ STR73	Prop. 0-10 Vdc	Centralized	
AX536	Built-in / STR73	Prop. 0-10 Vdc	Centralized	
AX537	Built-in / STR73	Prop. 0-10 Vdc	Centralized	
RA733	Built-in	floating	Centralized	
RA734*	Built-in/ STR72	floating*	On board***	
NR7312	STA71-75S-80S STR71	PI	via bus	via bus
NR7314	"	PI	via bus	via bus
NR7412	"	PI	via bus	via bus
NR7414	"	PI	via bus	via bus
NR7320BE	"	PI/3 stages	via bus	via bus
NR7321/2/3/4x**	"	PI/3 stages	via bus	via bus
NR7341/2/3/4xx**	"	PI/3 stages	via bus	via bus
NR7515	"	PI	via bus	via bus
NR7517	"	PI	via bus	via bus

- * RA734 can drive 1 or 2 on-off valves instead of floating ones.
- ** different models are available according to the application and the valve type.
- *** for 2-pipe only

fan-coil and vav control

TERMINAL UNIT CONTROLS

FAN CONTROL	FAN SPEED MAN. SELECTOR	CONTROL OF 1 VALVE (2-PIPE)	CONTROL OF 2 VALVES (4-PIPE)	Supply Vca	DEVICE TYPE
X	X	X			electro-mechanical
X				230	"
X				230	"
X	X	MVA-V.Z		230	"
X	X	MVA-V.Z	MVA-V.Z	230	"
X	X	MVA-V.Z	MVA-V.Z	230	"
		MVT4/V.T	MVT4/V.T	24	"
X	X	MVT4/V.T	MVT4/V.T	24	"
		MVT4/V.T	MVT4/V.T	24	"
X	X	MVT4/V.T	MVT4/V.T	24	"
		MVT4/V.T		24	microprocessor
	X		MVT4/V-T	24	"
via auxiliary relay	Only with STA80S	MVA4/V-ZB		24	digital centralized
"	"		MVA4/V-Z-B	24	"
"	"	MVT4/V-T		24	"
"	"		MVT4/V-T	24	"
3-stage fan control	"	Electric coil+MVA4/V.ZB		24	
"	"	on/off MVA4 MVT4/MVT5-V-T		24	"
"	"		on/off MVA4 MVT4/MVT5-V-T	24	"
		For VAV 1 output 0-10 Vdc + MVA4/V.ZB	For VAV 1 output 0-10 Vdc+MVA4/V.ZB	24	"
		"	as above excluding MVT4/V.T	24	"

digital system for hvac



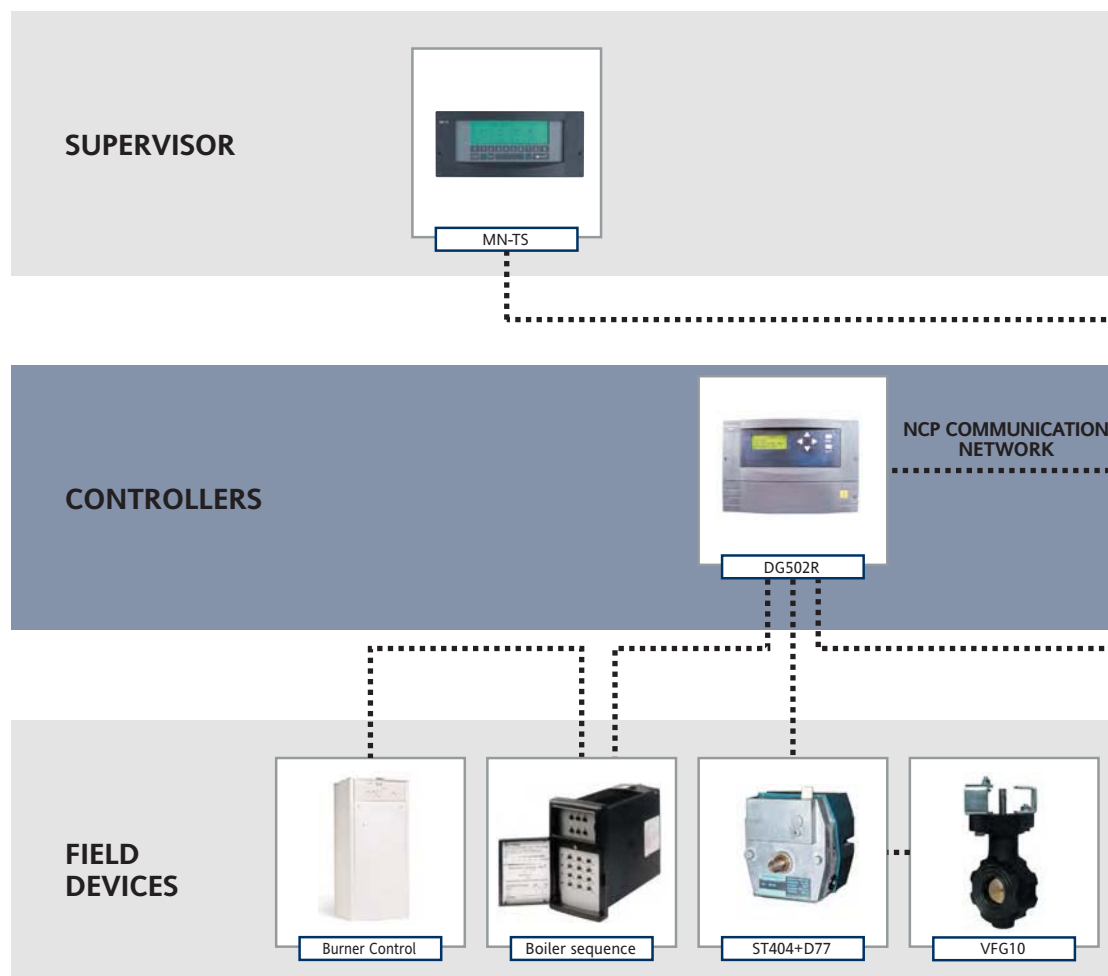
DIGITROLL 500

GENERAL INFORMATION

DG500 is an application-specific digital controller, which allows to monitor and manage in a completely automatic way the required plant type, chosen among the several configured available applications.

The controller is designed to operate stand-alone, but it also provides the capability to be supervised. Supervision can be carried out either by simply connecting a MN-TS network display or, for more complex systems, DG500 can be integrated into a network with traditional supervision by PC running MN-VW.

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digital system for hvac

MODEMMODEM



MN-VW



MNN-MI-100



DG501R



DG501C-DG502C-DG503C-DG504C-DG505C-DG501M



DG500



ST.71L-STA7.L



MS41



SH5-MVL5.



MVB



3V-VM



VSB- VMB

digital system for hvac

DIGITROLL 500



HVAC DDC Controllers

Series DG500 – Pre-programmed controllers for air conditioning and heating applications.

Each application is activated by connecting the related peripherals.

10 Universal Inputs (NTC sensors model ST.7.L, Transmitters 0...10 V-, contact SPST) +2 Digital Inputs. 6 Digital Outputs + 4 Analogue Outputs 0...10 V-. It uses a fully interactive LCD display. Supply 24 V a.c., 15 VA. Dimensions: 244X165X55 mm. Wall mounting on 35-mm rail (DIN 46277/3) or flush mounting with Kit DG510. Protection IP40. DG500 controllers can operate as stand-alone or connected to a NCP network.

MODEL	OTHER CHARACTERISTICS
DG501C	<p>Controller for Main air conditioning with fan coil water.</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. Main air, 2 coils (heating, cooling), humidification. Dew point compensation control or at set point value, on-off humidistat, anti frost thermostat. 2. Main air, 2 coils (heating, cooling), humidification. Dew point compensation control or at set point value, on-off humidistat, anti frost thermostat + 2-pipe fan coil water production. Hot water control with compensation or at set value, cool water control at set value. 3. Main air, 2 coils (heating, cooling), humidification, dew point compensation control or at set point value, on-off humidistat, anti frost thermostat + 4-pipe fan coil tubes water production. Hot water control with compensation or at set value, cool water control at set value. 4. Main air, 3 coils (heating, cooling, re- heating), humidification. Dew point control and supply air temperature compensation or at set value, on-off humidistat, anti frost thermostat. 5. Main air, 3 coils (heating, cooling, post heating), humidification. Dew point control and supply air temperature compensation or at set value, on-off humidistat, anti frost thermostat + 2-pipe fan coil water production. Hot water control with compensation or at set value, cool water control at set value. 6. Full Air AHU, 2 coils (heating, cooling), humidification. Room temperature control with compensation (summer) or at set value, supply min. limit. On-off humidistat, anti frost thermostat. 7. Full Air AHU, 3 coils (pre-heating, heating, cooling), humidification. Pre-heating control and room temperature control with compensation (summer) or at set value. On-off humidistat, anti frost thermostat. 8. 2-pipe fan coil water production. Hot water control with compensation or at set value, cool water control at set value. 9. 4-pipe fan coil water production. Hot water control with compensation or at set value, cool water control at set value.
DG502C	<p>Controller for Air Handling Unit at constant flow (damper management).</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. AHU with 2 coils (heating, cooling), humidification. Room/return temperature control, enthalpy comparison or outside/return temperature comparison by damper positioning. Minimum positioning of outside air. Manual (optional) room set point. Anti frost thermostat. 2. AHU with 2 coils. As application 1 with min. limit action on supply air. 3. AHU with 3 coils (heating, cooling, re-heating), on off humidification. Control of room or return temperature, enthalpy or only outside/return temperature comparison by damper positioning. Min. positioning of outside air. Manual (optional) room set point. Anti frost thermostat 4. AHU with 3 coils. As applications 1 or 2. with proportional humidification. 5. AHU with 2 coils. As applications 1. to 4. + re-heating electric coil On-Off control.
DG503C	<p>Controller for full-air Air Handling Unit.</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. Main Air. 1 coil (heating / cooling), proportional humidification, S/W changeover, antifrost thermostat. Dew point control (Summer) and set point value control (Winter). 2 stage re-heating electric coil. Heat Pump. 2. Main Air. 2 coils (heating, cooling), proportional humidification, antifrost thermostat. Fixed set point control.
DG504C	<p>Controller dedicated to swimming-pool thermoventilation, tank water control and HWS.</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. AHU 1 coil (heating). Set point room temperature control + proportional minimum limit on supply (optional), + 1 assistance two-stage electric coil (optional). Room humidity control by modulating damper positioning+ damper control with room temperature minimum limit+ remote recalibration, antifrost thermostat. TANK: proportional control of set point tank water+max temperature limit of tank water (optional). 2. AHU 1 coil (heating), like application 1 + HWS. Proportional control of setpoint water temperature 3. AHU 1 coil (heating), like application 1+ general loop.Setpoint proportional control through 0-10Vdc or resistive sensor. Direct /reverse action adjustable from LCD

digital system for hvac

DIGITROLL 500

MODEL	OTHER CHARACTERISTICS
DG505C	Multi function controller for Main air conditioning with On/Off and Generic Loop
DG501M	<p>Multi-loop controller with 4 +1 universal loops</p> <p>LOOP 1</p> <ul style="list-style-type: none"> • Proportional (P+I) Loop with heating/cooling action settable by LCD. • Minimum or maximum limit settable by LCD. • Resistive or voltage (0-10 Vdc) sensor input. • Outside compensation (if outside sensor is present): it can be excluded by LCD. • Individual time schedule with one changeover (On – off). • 2 holiday periods common to all loops. <p>LOOP 2</p> <ul style="list-style-type: none"> • Proportional (P+I) Loop with heating/cooling action settable by LCD. • Minimum or maximum limit settable by LCD. • Resistive or voltage (0-10 Vdc) sensor input. • Outside compensation (if outside sensor is present): it can be excluded by LCD. • Individual time schedule with one changeover (On – off). • 2 holiday periods common to all loops. <p>LOOP 3</p> <ul style="list-style-type: none"> • Proportional (P+I) Loop with heating/cooling action settable by LCD. • Resistive sensor input. • Temperature range management (if the Res and L sensors are present). • Outside compensation (if outside sensor is present): it can be excluded by LCD. • Individual time schedule with one changeover (On – off). • 2 holiday periods common to all loops. <p>LOOP 4</p> <ul style="list-style-type: none"> • Proportional (P+I) Loop with heating/cooling action settable by LCD. • Resistive sensor input. • Fixed point set settable by LCD. • Individual time schedule with one changeover (On – off). • 2 holiday periods common to all loops. <p>LOOP 5</p> <ul style="list-style-type: none"> • ON/OFF Loop with heating/cooling action settable by LCD. • Voltage sensor input. • Fixed point set adjustable by LCD • Individual time schedule with one changeover (On – off). • 2 holiday periods common to all loops.
DG501R	<p>Controller for heating climatic control and hot water service.</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. One zone with compensated climate control + 2 position HWS. Optimizer. Frost protection. Economy and anti-legionella functions. 2. Two zones with compensated climate control + 2 position HWS. Optimizer. Frost protection. Economy and anti-legionella functions. 3. Three zones with compensated climate control + 2 position HWS. Optimizer. Frost protection. Economy and anti-legionella functions. 4. One zone with compensated climate control + 2 position and proportional HWS. Optimizer. Frost protection. Economy and anti-legionella functions. 5. Two zones with compensated climate control + 2 position and proportional HWS. Optimizer. Frost protection. Economy and anti-legionella functions. 6. Three zones with compensated climate control + 2 position and proportional HWS. Optimizer. Frost protection. Economy and anti-legionella functions.
DG502R	<p>Controller for heating plant with boiler sequence.</p> <p>Applications:</p> <ol style="list-style-type: none"> 1. Two boilers in sequence 2. Two boilers in sequence + 1 climate zone compensated by optimizer. Frost protection. Economy function. 3. Three to six boilers in sequence (add boiler sequencer), 1 climate zone and/or On-Off or proportional hot water service. Antilegionella function.
DG510	Flush mounting Kit for DG500 controllers



Sensors and Manual Set

Series ST.7.L NTC sensors 10 kOhm, at 20 °C 5573 ohm.

TU Transmitters 0...10 V cc, see page 39.

MODEL	OTHER CHARACTERISTICS
STA71L	Room sensor - dimensions 86x86x30 mm - IP 30
STA75L	Room sensor, set 10...35°C - dimensions 86x86x30 mm - IP 30
STC71L	Immersion sensor - range -10.. 120 °C - 1/2" connection - immersion length 120 mm - IP 65
STD71L	Duct sensor - range -5..100°C - immersion length 100 to 330 mm - IP65
STE71L	Outside sensor - range -20..40 °C - IP 65
STES71L	Solar sensor - range -20..40 °C - IP65
STF71L	Strap-on sensor - range 0.. 100 °C - IP 65
RM55L	Remote room set point adjustment 5...50 °C – dimensions 86x86x30 mm - IP20



field devices: sensors and transmitters, actuators, valve bodies

Field devices are:

SENSORS (passive) temperature: Ohm output signal

TRANSMITTERS (active sensors) temperature, humidity, pressure, air quality.

Output signal 0÷10Vdc (3-wire)-4÷20mA (2-wire)

DAMPER ACTUATORS direct or crank-arm coupling on damper shaft. On/off, floating, proportional potentiometric and voltage or current proportional control signal, with or without spring return.

VALVE ACTUATORS to motorize valve bodies. On/off, floating, proportional potentiometric and voltage or current proportional control signal, with or without spring return.

The actuators are supplied with linkage for valve mounting.

MOTORIZED VALVES 2-, 3-way, 3-way 4 port valves, PN16 threaded max DN 2", equipped with on/off, floating or proportional actuator, with or without spring return, for application such as zone valves, terminal units and re-heating coils.

VALVE BODIES

- globe 2-, 3-way, 3-way 4 port valves, PN16 threaded connections DN ½"÷¾", application in zones, terminal units and air conditioning (hot/chilled water) plants.

- globe 2-way simple seat, balanced plug or double seat and 3-way mixing valves PN16 threaded DN ½"÷2", PN16-25-40 flanged DN15÷200 mm, for residential and industrial applications with hot/chilled water, overheated water, steam, diathermic oil.

- butterfly PN10 valves, DN40÷100 mm, application with hot/chilled water.

- 3- and 4-way shoe valves, PN6 threaded DN 1"÷2", flanged 40÷100 mm

ALL CONTROLLI VALVES ARE PED ("Pressure Equipment Directive" 97/23/CE) COMPLIANT



This chapter gives a brief description of the elements, sensing the physical variables, installed on field, i.e. on air conditioning handling units, heating and cooling plants and centrals, industrial thermal process machines and plants.

Sensors



Temperature Sensors

SB... Balco 1000 Ohm 21,1°C sensing element - for KX436 - CX528 controllers

MODEL	OTHER CHARACTERISTICS
SBA	room sensor (dimensions 85x55x32 mm) - IP30
SBA20	room sensor with two sensing elements(dimensions 115x85x32 mm) - IP30
SBA55	room sensor with set point adjustment potentiometer 5±35°C (dimensions 115x85x32 mm) - IP30
SBC	immersion - AISI 304 stainless steel well- 1/2" gas nickel-plated brass connection length 113 mm - PG9 cable sleeve - max fluid temp.: 140°C - IP44
SBD	duct - with mounting flange - 7,5 mm - length 300 mm - PG9 cable sleeve, max fluid temp.: 95°C - IP44
SBE	outside - PG9 cable sleeve - IP44
SBF	strap-on (immersion) - IP44
SBV	as SBD but with uncovered fast-detecting sensing element - length 315 mm, max fluid temp.: 65°C - IP44 Not suitable for applications with possible condensation
421	sheath for SBC with AISI 304 stainless steel connection
422	as above in nickel-plated brass



Temperature Sensors

PTC (SPTC) and PT100 sensing element (SPTX-U only) for Omnia - CTX controllers

MODEL	OTHER CHARACTERISTICS
SPTC-A	room sensor for Omnia controllers (dimensions 86x86x31 mm) - IP30
SPTC-A5	room sensor for Omnia with set point adjustment (dimensions 86x86x31 mm) - IP30
SPTC-C	immersion sensor for CTXxx1 and Omnia cable type, 1,5 m silicone cable
SPTC-CR	immersion sensor for CTXxx1 and Omnia with case and stick enclosed
SPTC-D	duct sensor for CTXxx1 and Omnia, cable type, 1,5 m silicone cable
SPTC-E	outside sensor for Omnia with PG9 cable sleeve - IP44
SPTC-F	strap-on pipe sensor for Omnia - IP44
SPTC-V	as SPTC-D but with case and stick enclosed for Omnia and CTXxx1 - length 315 mm max temperature 65°C - IP44 Not suitable for applications with possible condensation
SPTX-U	universal sensor for CTXxx2, PT100 sensing element, cable type, 3 m cable



ST... NTC thermistor : STA/STR, 5 K Ohm at 25°C, STR72 10 Kohm at 25°C, STR73 33 Kohm at 25°C - Application range 0÷50°C

MODEL	OTHER CHARACTERISTICS
STA71	room sensor with set point adjustment 5±35°C for NR7000 (dim. 85x55x32 mm) - IP30
STA75S	room sensor with set point adjustment 5±35°C 3K for NR7000 (dimensions 86x86x31 mm) - IP30
STA80S	room sensor with set point adjustment 3 K - on/off and fan speed selector for NR7000 (dimensions 86x86x31 mm) - IP30
STR71	return air sensor with mounting kit for terminal unit - for NR7000 - IP30
STR72	return air or pipe-contact sensor without mounting kit - for RA734 - IP30
STR73	return air or pipe-contact sensor without mounting kit - for AX526/527/536/537 - IP30

Sensor models in other sections of the present guide:
SP. - TP. Platinum sensors for **TX** controllers, see page 13;
ST.71/75L for DG500 Liberty controllers, see page 35;
SNTC sensors for **AXC**, see page 12.

Transmitters

Temperature Transmitters

Output signal 0 to 10 V d.c. or 4 to 20 mA - "Integrated" sensing element for DG500, CTXxx3. See pages 13 and 34-35.

MODEL	RANGE °C	OUTPUT SIGNAL	APPLICATION
TT-A21	0 to 50	4 to 20 mA	room - dimensions 115 x 85 x 32 mm
TT-A31	0 to 50	0 to 10 V dc	as above
TT-C21	0 to 100	4 to 20 mA	immersion - 113 mm stainless steel well - AISI 304 stainless steel 1/2" connection - IP55
TT-C22	-50÷50	4 to 20 mA	as above
TT-C23	0 to 300	4 to 20 mA	immersion - length 175 mm - 1/2" stainless steel connection without well, Pt100 Ohm 0°C sensing element
TT-C24	0 to 500	4 to 20 mA	as above with FeCo thermocouple sensing element
TT-C31	0÷100	0÷10 Vcc	as TT-C21
TT-D21	-50÷50	4÷20 mA	duct, 300 max stem length, with wall mounting kit. IP55
TT-D31	-50÷50	0÷10 Vcc	as above
TT-E21	-50÷50	4÷20 mA	outside - IP55

Humidity Transmitters

Series TU - Capacitive sensing element 0 to 95% R.H. - For W500H /DG500 controllers, see pages 18 and 34-35.

Series TUT - Humidity-sensing element and Balco 1000 Ohm at 21.1 °C temperature sensing element - For W500H controllers, see page 18.

MODEL	OUTPUT SIGNAL	APPLICATION
TU-A33	4÷20 mA (2-wire)/0÷10 Vdc(3-wire) configurable	room (dimensions 84 x116 x 24 mm) - IP 20
TU-D33	4÷20 mA (2-wire)/0÷10 Vdc(3-wire) configurable	duct - rod Ø 12.5 mm - length 230 mm - IP 65
TUTA33	0 to 10 V dc/Ohm (temp.)	room (dimensions 84 x116 x 24 mm) - IP 20
TUTD33	0 to 10 V dc/Ohm (temp.)	duct - rod Ø 12.5 mm - length 230 mm - IP 65

Pressure and Differential Pressure Transmitters

Series TP - Output signal 0 to 10 V d.c. 24 Vac power supply - for CTXxx3 controllers. See page 13.

MODEL	RANGE	MAX PRESSURE	APPLICATION
TP-C31	0 to 100 kPa	2000 kPa	pressure of not aggressive gas and liquids differential G 1/8" connections - IP54
TP-C34	0-500/1000/2000 kPa	+300%	pressure of not aggressive gas and liquids - G 1/8" - IP65
TP-C351	0 to 600 kPa	1200 kPa	differential pressure of not aggressive gas and liquids G 1/8" connections - IP65
TP-C361	0÷1000 kPa	1200 kPa	as above - IP65
TP-D333	0-312,5/625/1250 Pa adjustable with central "0"	68 kPa	differential pressure of air and not aggressive gas PVC internal Ø 6 mm connections - IP65
TP-D334	0-62,5/125/250 Pa adjustable with central "0"	68 kPa	differential pressure of air and not aggressive gas PVC internal Ø 6 mm connections - IP65

Room Air Quality Transmitters

Series TQ - Output signal 0 to 10 V dc - Power supply 24 Vac

MODEL	OTHER CHARACTERISTICS
TQ-A31	room - range 1 to 100% (dimensions 115 x 85 x 32 mm) - IP20
TQ-D31	as above, duct type



field devices

Damper Actuators



5 Nm



10 and 20 Nm



4 Nm



7 and 15 Nm

Damper Actuators for Direct Coupling to Damper Shaft
MDB series. Without spring return. Max rotation angle 95°, adjustable by mechanical stops. IP54 protection.

MODEL	INPUT SIGNAL	TORQUE Nm	SUPPLY Vca	CONSUMPTION VA	DAMPER SURFACE m ²	TIMING (S FOR 90°)
MDB24	floating	10	230	5.5	2	150
MDB26	floating	20	230	6	4	150
MDB42	floating	5	24	1,5	1	150
MDB44	floating	10	24	3.5	2	150
MDB46	floating	20	24	4	4	150
MDB52	0-10 V	5	24	2	1	150
MDB54	0-10 V	10	24	4	2	150
MDB56	0-10 V	20	24	4	4	150

Accessories for MDB Actuators

MODEL	DESCRIPTION
DMDB	Two auxiliary microswitches for MDB, SPDT1 mA...3(0.5) A, 250 V AC

Damper Actuators for Direct Coupling to Damper Shaft
DuraDrive series. With spring return.

MODEL	INPUT SIGNAL	TORQUE Nm	SUPPLY V a.c.	AUXILIARY MICROSWITCH	TIMING (S FOR 90°)	ACCESSORY FOR START-SPAN
MA40-7041-G00	On/off.	4	230	-	50	-
MA40-7041-G01	On/off.	4	230	1	50	-
MA40-7043-G00	On/off	4	24	-	50	-
MA40-7043-G01	On/off	4	24	1	50	-
MA41-7071-G00	On/off	7	230	-	80	-
MA41-7071-G02	On/off	7	230	2	80	-
MA41-7073-G00	On/off	7	24	-	80	-
MA41-7073-G02	On/off	7	24	2	80	-
MA41-7151-G00	On/off	15	230	-	190	-
MA41-7151-G02	On/off	15	230	2	190	-
MA41-7153-G00	On/off	15	24	-	190	-
MA41-7153-G02	On/off	15	24	2	190	-
MF40-7043-G00	Floating	4	24	-	130	-
MF40-7043-G01	Floating	4	24	1	130	-
MF41-7073-G00	Floating	7	24	-	195	-
MF41-7073-G02	Floating	7	24	2	195	-
MF41-7153-G00	Floating	15	24	-	190	-
MF41-7153-G02	Floating	15	24	2	190	-
MS40-7043-G00	2-10 V	4	24	-	130	AM-703
MS40-7043-G01	2-10 V	4	24	1	130	AM-703
MS41-7073-G00	2-10 V	7	24	-	195	AM-703
MS41-7073-G02	2-10 V	7	24	2	195	AM-703
MS41-7153-G00	2-10 V	15	24	-	190	AM-703
MS41-7153-G02	2-10 V	15	24	2	190	AM-703

Damper Actuators

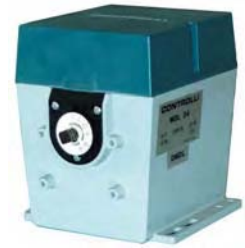
Damper Actuators: Crank-arm Mounting Type

Series MDL* - Bidirectional motor- Input signal P.C. board - Power consumption 12VA - 2 output shafts: main and seconds shaft Ø 9.5 x 9.5 mm - MDL30-50 angular travel set at 90°adjustable between 55 and 160°- MDL20-40 angular travel set at 90°adjustable between 0 and 160° - Force 500 N - Manual override - IP 55.

MODEL	TIMING s 90° - 160°	TORQUE Nm	ANGULAR TRAVEL ADJUSTABLE	SUPPLY V a.c.	MAX Damper Surface m ²	ACTION
MDL22	15 - 27	6	0 to 160	230	1.2	On-Off, floating
MDL24	40 - 71	20	0 to 160	230	4	"
MDL26	60 - 107	30	0 to 160	230	6	"
MDL42	15 - 27	6	0 to 160	24	1.2	"
MDL44	40 - 71	20	0 to 160	24	4	"
MDL46	60 - 107	30	0 to 160	24	6	"
MDL32	15 - 27	6	55 to 160	24	1.2	Proportional potentiometric (165 Ohm)
MDL34	40 - 71	20	55 to 160	24	4	
MDL36	60 - 107	30	55 to 160	24	6	
MDL52	15 - 27	6	55 to 160	24	1.2	Vdc/current proportional control. Range 6 to 9, 4 to 7, 8 to 11, 1 to 5, 0 to 10 V d.c., 4 to 20 mA
MDL54	40 - 71	20	55 to 160	24	4	
MDL56	60 - 107	30	55 to 160	24	6	

VARIANTS: in case the MDL20/40 actuators are needed to be supplied with 1 KOhm auxiliary potentiometer, add PA2 for MDL20 and PA4 for MDL40: e.g. MDL24PA2, or MDL46PA4. In special applications, the actuators can be supplied with 2 or 3 aux. potentiometers.

* MDL actuators can be used with VFG10 series butterfly valve bodies, mounting the AF22 linkage.



Accessories and Options for MDL

MODEL	DESCRIPTION
MDL55*	electronic card input signal range 6 to 9, 4 to 7, 8 to 11, 1 to 5 V d.c., 4 to 20 mA.
MDLV5*	electronic card input signal range 0 to 10 V d.c., 4 to 20 mA adjustable start point and span
DMDL	two auxiliary microswitch SPDT 10 (3) A - 240 V a.c. adjustable on the whole stroke for MDL
MDLA1	damper drive linkage for MDL
MDLA2	linkage for mounting MDL when replacing SL
MDLAV+AF22	linkage and mounting operation on VFG10 series butterfly valve
MDLPA2	card with 1 K Ohm auxiliary potentiometer for MDL2
MDLPA4	as above for MDL4
YS7	crank-arm in addition to MDLA1 composed of 2 joints and 8-mm rod for 10÷18mm shaft for MDL

* Only for MDL 32-34-36

Actuators



Actuators for Zone Valves and Terminal Units

Series MVA2 - Electrothermal type - For all on/off SPST controller. Torque 110N - for V.ZB valve bodies, see page 47. Protection IP31.

Series MVA4. - Electrothermal type - PWM Proportional and on-off 24 V a.c. controllers - Torque 110N - for V.ZB valve bodies. Protection IP31.

MODEL	POWER SUPPLY Vac	CONSUMPTION VA	OTHER CHARACTERISTICS
MVA21	110 to 230 V a.c.	5	with cable 1.5m (CEI 20-22/II)
MVA23	110 to 230 V a.c.	5	without cable
MVA41	24 V a.c.	5	with cable 1.5m (CEI 20-22/II)
MVA43	24 V a.c.	5	without cable

Series MVT4. - Bidirectional type - Driving signal from any floating controller, e.g. DIGITROLL 7000 NR732xB-734xBx, RA733/734 - Torque 200N - Stroke 6,5mm, stroke time 117 s. - for V.T - V.BT - V.XT valve bodies. Protection IP43.

Series MVT5. - Bidirectional type with microprocessor module for proportional signal V dc and mA - 24 Vac power supply - Torque 200N - Stroke 6,5mm, stroke time 117 s. - for V.T - V.BT - V.XT valve bodies. Protection IP43.

MODEL	POWER SUPPLY Vac	CONSUMPTION VA	OTHER CHARACTERISTICS
MVT44	24	0,5	3-position control
MVT56	24	1	0÷10/ 6÷10/ 1÷5/ 2÷10/ 4÷7/ 6÷9/8÷11 Vdc prop. control- direct/reverse action
MVT57	24	1	0÷10 Vcc - prop. control- direct action

Accessories

MODEL	DESCRIPTION
D41	auxiliary switch for MVA 23 and MVA43

Globe Valve Actuators

Series MVB - Bidirectional motor for V.B threaded ½"÷2" and flanged 15÷65 valve bodies - Supplied with linkage for mounting on valve body - Force 450 N - IP50.

MODEL	TIMING s	SUPPLY V a.c.	CONSUMPTION VA	OTHER CHARACTERISTICS
MVB22	37	230	5	On-Off, floating
MVB26	60	230	5	
MVB28	370	230	5	
MVB46	60	24	5	proportional potentiometric
MVB36	60	24	5	
MVB52	37	24	5	Vdc/ current proportional control. Range: 6 to 9, 4 to 7, 8 to 11, 0 to 10, 2 to 10, 1 to 5 V dc, 4 to 20 mA. Default setting: 0÷10Vdc
MVB56	60	24	5	
MVBAV	assembling MVB on valve bodies			

WARNING:

Actuators are supplied NOT mounted on valve bodies. In case the actuator-valve assembly is required, order the specific part number MVBAV together with the models of actuator and valve body.

Actuators

Globe Valve Actuators

Series MVF - Brushless motor for any Controlli valve, threaded and flanged, up to DN 80, see linkages AG50-51-52 (page 55) - Self-stroking, self-adjusting - Linkages to valves from other manufacturers are available. Contact our customer service for details.

MODEL	FORCE N	SUPPLY Vca	CONSUMPTION VA	OTHER CHARACTERISTICS
MVF54	400	24	5	3-position proportional control (selectable)
MVF58	800	24	5	

Globe Valve Actuators

Series MVL - For all valve bodies with self-adjusting stroke 10 to 45 mm - Supplied with linkage for mounting on valve body - For VSB - VSB-F - VMB - VMB-F only, add AG31 accessory, see page 55 - Force MVL 1500 N, MVLA/C 700 N. Manual control device, except spring return models (MVLA/C). Protection IP55.

MODEL	Timing (s) depending on valve stroke			Supply V a.c.	Consumption VA	ACTION	OTHER CHARACTERISTICS
	16.5	25	45				
MVL26	22	33	60	230	12	On-Off floating 230 V ac	-
MVL46	22	33	60	24	12	On-Off floating 24 V ac	-
MVL46A	22 (16)	33 (25)	60 (45)	24	12	On-Off floating 24 V ac	spring return stem up
MVL46C	22 (16)	33 (25)	60 (45)	24	12	On-Off floating 24 V ac	spring ret. stem down
MVL66	22	33	60 (45)	110	12	On-Off floating 110 V ac	-
MVL36	22	33	60	24	12	proportional potentiometric	-
MVL36A	22 (16)	33 (25)	60 (45)	24	12		spring return stem up
MVL36C	22 (16)	33 (25)	60 (45)	24	12		spring ret. stem down
MVL56	22	33	60	24	12	Vdc/ mA proportional control. Range: 6 to 9, 4 to 7, 8 to 11, 0 to 10, 2 to 10, 1 to 5 V dc, 4 to 20 mA. Default setting: 0÷10Vdc	-
MVL56A	22 (16)	33 (25)	60 (45)	24	12	Vdc/ mA proportional control. floating control Default setting: 0÷10Vdc	spring return stem up
MVL56C	22 (16)	33 (25)	60 (45)	24	12		spring ret. stem down
MVL56FA	17 (45)	25 (60)	48 (114)	24	15	Vdc/ mA proportional control. floating control Default setting: 0÷10Vdc	spring return stem up
MVL56FC	17 (45)	25 (60)	48 (114)	24	15		spring ret. stem down
MVLAV	assembling MVL on valve body						
MVLMAV	assembling MVL A/C on valve body						

Note: The values in brackets express the return time by spring return. By spring return: MVLA closes two-way valves and direct way in three-way valves, MVLC opens two-way valves and direct way in three-way valves. This is valid for all valves except SS-DS in which happens the opposite.

Series SH - Bidirectional motor for all valve bodies having 10 to 45 mm stroke. Supplied with linkage for mounting on valve body. For VSB, VSB.F, VMB, VMB.F only, add AG21 accessory (see page 55). Force 1200 N. Protection IP40.

MODEL	TIMING s	SUPPLY V a.c.	CONSUMPTION VA	OTHER CHARACTERISTICS
SH222	80	24	9	On-Off floating
SH242	80	230	9	On-Off floating
SH522	80	24	9	Vdc/ current proportional control. Range: 6 to 9, 4 to 7, 8 to 11, 0 to 10, 2 to 10, 1 to 5 V dc, 4 to 20 mA. Default setting: 0÷10Vdc
SH552	80	24	9	as above but only 0 to 10 V dc
SH2AV	Assembling SH on valve bodies.			

WARNING:

Actuators are supplied NOT mounted on valve bodies. In case the actuator-valve assembly is required, order the specific part number SH2AV together with the models of actuator and valve body



Actuators



Globe Valve Actuators

Series ST400 - Bidirectional actuator with manual control and position indicator. Supplied with linkage for mounting on valve body. For VSB, VSB.F, VMB, VMB.F only, add AG21 accessory (see page 55). Force 1500 N. Protection IP40.

MODEL	TIMING S	SUPPLY Vac	POWER CONSUMPTION VA	OTHER CHARACTERISTICS
ST402	360	230	9	on/off floating suitable for 400 Line and DG3000 controllers
ST2AV	assembling ST402 on valve body			

WARNING:

Actuators are supplied NOT mounted on valve bodies. In case the actuator-valve assembly is required, order the specific part number ST2AV together with the models of actuator and valve body.

Actuators for Shoe and Butterfly Valves

Series ST400 - Bidirectional actuator for all butterfly and shoe valves having stroke 10÷45 mm - Manual control - Supplied with linkage for mounting on valve body. Force 1500 N. Protection IP40.

MODEL	TIMING S	SUPPLY Vac	POWER CONSUMPTION VA	OTHER CHARACTERISTICS
ST404	360	24	5	for butterfly and shoe valves M3 - M4 all size
ST405	360	230	5	
ST5AV	assembling ST404/405 on valve body			

WARNING:

Actuators are supplied NOT mounted on valve bodies. In case the actuator-valve assembly is required, order the specific part number ST5AV together with the models of actuator and valve body.



Accessories for MVB - MVF - MVL - SH - ST Actuators

MODEL	DESCRIPTION
D36	one stroke-end auxiliary microswitch adjustable on the whole stroke for MVB
D5	one stroke-end auxiliary adjustable microswitch for SH
D77	two auxiliary microswitches for ST404/405
DMVF	two auxiliary adjustable microswitches for MVF
DMVL	two auxiliary microswitches adjustable on the whole stroke for MVL
MVBC	rain-proof protection (see picture on the left)
MVBD	microswitch driven by manual control knob. Supplied only factory-mounted.
MVBHT	spacer for MVB. To be used with V.B/V.BF valves with temperature from 120 to 140 °C
MVBPA2	1 kOhm auxiliary potentiometer for MVB46. Supplied only factory-mounted.
MVLHT	Spacer for high temperature. To be used with valve bodies with fluid temp. higher than 150°C (SS, VSS, VBG, VBS, VBAA, VMS, 3VAA, DS)
MVLP A2	1000 Ohm auxiliary potentiometer for MVL26
MVLP A4	1000 Ohm auxiliary potentiometer for MVL46
MVLP A4M	1000 Ohm auxiliary potentiometer for MVL46A/C
MVLP A6	1000 Ohm auxiliary potentiometer for MVL66
P1000-1	1000 Ohm auxiliary potentiometer for SH

All accessories, except MVBPA2 and MVBD, are supplied separately. Mounting is carried out by the customer.

Micra

Micra - Fan Coil Motorized Valves

Actuators series MVX - Electrothermal actuator for V.X valves - Protection IP44.

MODEL	STARTING TIME s	SUPPLY Vac	FORCE N	ACTION
MVX21	60	110-230	90	on-off
MVX41	60	24	90	"
MVX57	60	24	90	proportional 0÷10 Vdc

Series V.X. - NP 16 brass valve bodies - Tight close-off both on direct and angle way - NBR plug - Fluid: water and water+glycol 50% max. - temperature 5÷95°C - Stroke 2,5 mm - Threaded connections for conic and flat tight. Motorized by MVX*.

MODEL	Kvs		CLOSE-OFF bar	ACTION TYPE DIRECT WAY	THREADED CONNECTIONS	TIGHT
	DIRECT WAY	ANGLE WAY				
VSX09P	0.25	-	2.5	2-way n.c.	G 1/2" M	flat
VSX10P	0.4	-	2.5	"	G 1/2" M	flat
VSX11P	0.6	-	2.5	"	G 1/2" M	flat
VSX12P	1	-	2.5	"	G 1/2" M	flat
VSX13	1.6	-	2.5	"	G 1/2" M	conic
VSX13P	1.6	-	2.5	"	G 1/2" M	flat
VSX21	2.5	-	1.5	"	G 3/4" M	conic
VSX21P	2.5	-	1.5	"	G 3/4" M	flat
VSX2P	3.7	-	1.5	"	G 3/4" M	flat
VMX09P	0.25	0.25	2.5	3-way	G 1/2" M	flat
VMX10P	0.4	0.4	2.5	"	G 1/2" M	flat
VMX11P	0.6	0.6	2.5	"	G 1/2" M	flat
VMX12P	1	0.8	2.5	"	G 1/2" M	flat
VMX13	1.6	1	2.5	"	G 1/2" M	conic
VMX13P	1.6	1	2.5	"	G 1/2" M	flat
VMX21	2.5	1.6	1.5	"	G 3/4" M	conic
VMX21P	2.5	1.6	1.5	"	G 3/4" M	flat
VMX2P	3.7	2.5	1.5	"	G 3/4" M	flat
VTX09P	0.25	0.25	2.5	3-way 4-port	G 1/2" M	flat
VTX10P	0.4	0.4	2.5	"	G 1/2" M	flat
VTX11P	0.6	0.6	2.5	"	G 1/2" M	flat
VTX12P	1	0.8	2.5	"	G 1/2" M	flat
VTX13	1.6	1	2.5	"	G 1/2" M	flat
VTX13P	1.6	1	2.5	"	G 1/2" M	flat
VTX09P4**	0.25	0.25	2.5	"	G 1/2" M	flat
VTX10P4**	0.4	0.4	2.5	"	G 1/2" M	flat
VTX11P4**	0.6	0.6	2.5	"	G 1/2" M	flat
VTX12P4**	1	0.8	2.5	"	G 1/2" M	flat
VTX13P4**	1.6	1	2.5	"	G 1/2" M	flat
VTX21	2.5	1.6	1.5	"	G 3/4" M	conic
VTX21P	2.5	1.6	1.5	"	G 3/4" M	flat
VTX2P	3.7	2.5	1.5	"	G 3/4" M	flat

* In case of motorized valves add to the valve model code M2 for MVX21 and M4 for MVX41: e.g..VMX13M2

** The models ending with "4" have interaxis 40 mm. instead of 35 mm.

V.X Accessories

MODEL	CHARACTERISTICS
VXC	Manual control for V.X and V.XT series valves



field devices

Valve Bodies



Valves Bodies for Zone and Fan Coil Units

Series V.XT - NP 16 forged brass valve body - Plug with double Viton OR. Flow characteristic: equal-percentage direct way, linear angle way. Fluid: water, temperature 2T95°C.

To be motorized with MVT actuator, see page 42.

MODEL*	Kvs		PRESS. DIFF. MAX kPa	ACTION TYPE DIRECT WAY	THREADED CONNECTIONS	
	DIRECT WAY	ANGLE WAY			DIRECT WAY	ANGLE WAY
VSXT09	0.25	-	350	2-way n.c.	G 1/2" M	-
VSXT10	0.4	-	350	"	G 1/2" M	-
VSXT11	0.6	-	350	"	G 1/2" M	-
VSXT12	1	-	350	"	G 1/2" M	-
VSXT13	1.6	-	350	"	G 1/2" M	-
VSXT1	2	-	250	"	G 1/2" M	-
VSXT21	2.5	-	250	"	G 3/4" M	-
VMXT09	0.25	0.25	350	3-way	G 1/2" M	G 1/2" M
VMXT10	0.4	0.25	350	"	G 1/2" M	G 1/2" M
VMXT11	0.6	0.4	350	"	G 1/2" M	G 1/2" M
VMXT12	1	0.6	350	"	G 1/2" M	G 1/2" M
VMXT13	1.6	1	350	"	G 1/2" M	G 1/2" M
VMXT1	2	1.6	250	"	G 1/2" M	G 1/2" M
VMXT21	2.5	1.6	250	"	G 3/4" M	G 3/4" M
VTXT09**	0.25	0.25	350	3-way, 4-port	G 1/2" M	-
VTXT10**	0.4	0.25	350	"	G 1/2" M	-
VTXT11**	0.6	0.4	350	"	G 1/2" M	-
VTXT12**	1	0.6	350	"	G 1/2" M	-
VTXT13**	1.6	1	350	"	G 1/2" M	-
VTXT1**	2	1.6	250	"	G 1/2" M	-
VTXT21	2.5	1.6	250	"	G 3/4" M	-

* All V.XT valves are available with flat tight. When ordering, add the letter "P" at the end of the model code; e.g. VSXT21P.

** These models are also available with flat tight and 40-mm interaxis, instead of 35 mm. When ordering, add "P4" at the end of the model code; e.g. VTXT1P4.

The former V.T series (VST-VMT-VTT) valves are still supplied as spare part.

Valve Bodies

Series V.Z. - As V.T, but with linear flow characteristic.
To be motorized by MVA electrothermal actuators, see page 42.

MODEL	Kvs		MAX. DIFF. PRESS. kPa	ACTION TYPE DIRECT WAY	THREADED CONNECTIONS	
	DIRECT WAY	ANGLE WAY			DIRECT WAY	ANGLE WAY
VSZ09B	0.25	-	150	2-way n.c.	G 1/2" M	-
VSZ10B	0.4	-	150	"	G 1/2" M	-
VSZ11B	0.6	-	150	"	G 1/2" M	-
VSZ12B	1	-	150	"	G 1/2" M	-
VSZ13B	1.6	-	150	"	G 1/2" M	-
VSZ1B	2.5	-	150	"	G 1/2" M	-
VSZ21B	2.5	-	150	"	G 3/4" M	-
VSZ2B	4	-	100	"	G 3/4" M	-
VMZ09B	0.25	0.25	150	3-way	G 1/2" M	G 1/2" M
VMZ10B	0.4	0.25	150	"	G 1/2" M	G 1/2" M
VMZ11B	0.6	0.4	150	"	G 1/2" M	G 1/2" M
VMZ12B	1	0.6	150	"	G 1/2" M	G 1/2" M
VMZ13B	1.6	1	150	"	G 1/2" M	G 1/2" M
VMZ1B	2.5	1.6	150	"	G 1/2" M	G 1/2" M
VMZ2B	4	2.5	150	"	G 3/4" M	G 3/4" M
VTZ09B	0.25	0.25	150	3-way 4-port	G 1/2" M	-
VTZ10B	0.4	0.25	150	"	G 1/2" M	-
VTZ11B	0.6	0.4	150	"	G 1/2" M	-
VTZ12B	1	0.6	150	"	G 1/2" M	-
VTZ13B	1.6	1	150	"	G 1/2" M	-
VTZ1B	2.5	1.6	150	"	G 1/2" M	-
VTZ21B	2.5	1.6	150	"	G 3/4" M	-
VTZ2B	4	2,5	150	"	G 3/4" M	-

Motorized Valves for Zone and Terminal Units

Series VSE/VDE - On/off actuator with aluminium case - Power supply 230 Vac - Spring return - Stroke end microswitch - Brass valve body - Temperature range 0÷93 °C - Mixing and diverting

MODEL	DN	kVS	MAX.DIFF. PRESS. kPa	ACTION
VSE1	1/2"	2,2	210	Two-way n.c.
VSE2	3/4"	3,0	140	"
VSE3	1"	6,9	103	"
VDE1	1/2"	2,6	210	Three-way
VDE2	3/4"	3,4	140	"
VDE3	1"	6,5	103	"



field devices

Valve Bodies



2-way Globe Valves

Series VSB (threaded) - VSB.F (flanged) - NP 16. To be motorized by MVB - MVB - MVL -SH actuators, see pages 42-43. VSB-VMB series is available also with stainless steel plug. For part number and prices please contact our export sales dept.

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS	
				MVB	SH-MVL	MVL A/C**		
VSB11	1/2"R	1	16.5	2 (10)	2 (10)	2 (10)	<ul style="list-style-type: none"> - Brass body for DN1/2", G 25 - cast-iron body for DN3/4"÷2" - brass internal parts - female threaded connections: fluid temp -10*÷150 °C, with MVB max 120°C, with MVB+MVBHT max 140°C - equal-percentage control flow characteristic - leakage 0.03% Kvs - for MVB actuator add AG52 - for MVL actuator add AG31 - for SH - ST actuators add AG21 - VSB8A linear control flow characteristics 	
VSB1	1/2"R	1,6	"	2 (10)	2 (10)	2 (10)		
VSB15	1/2"R	2,5	"	2 (10)	2 (10)	2 (10)		
VSB2	1/2"	4	"	2 (10)	2 (10)	2 (10)		
VSB3	3/4"	6,3	"	2 (10)	2 (10)	2 (10)		
VSB4	1"	8	"	2 (6,5)	2 (10)	2 (10)		
VSB5	1"1/4	16	"	2 (4)	2 (10)	2 (6)		
VSB6	1"1/2	22	"	2 (2,5)	2(8)	2 (4)		
VSB8	2	30	"	2	2 (6)	2 (3)		
VSB8A	2	40	"	2	2 (6)	2 (3)		
VSB11F	15 R	1	"	2 (10)	2 (10)	2 (10)		<ul style="list-style-type: none"> as above but with slip-on flanges connections NP16 - VSB9F linear control flow characteristic
VSB1F	15 R	1,6	"	2 (10)	2 (10)	2 (10)		
VSB15F	15 R	2,5	"	2 (10)	2 (10)	2 (10)		
VSB2F	15	4	"	2 (10)	2 (10)	2 (10)		
VSB3F	20	6,3	"	2 (10)	2 (10)	2 (10)		
VSB4F	25	8	"	2 (6,5)	2 (10)	2 (10)		
VSB5F	32	16	"	2 (4)	2 (10)	2 (6)		
VSB6F	40	22	"	2 (2,5)	2 (8)	2 (6)		
VSB8F	40	30	"	2	2 (6)	2 (6)		
VSB8AF	50	40	"	2	2 (6)	2 (8)		
VSB9F	65	63	20	1,6	2***	2		

() Max close-off differential pressure.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55)

** By spring return MVL closed, MVL open.

*** Not to be used with SH

2-way Tight Close-off Valves

Series VSBP (threaded) and VSBPF (flanged). On/off tight close-off valves - NP16 G25 cast iron. To be motorized by MVB2.-4. actuators, see page 42

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFFERENTIAL PRESS bar	OTHER CHARACTERISTICS
VSBP2	1/2"	4	8,8	11	<ul style="list-style-type: none"> - threaded connections - fluid temperature -5T 95°C - leakage 0% Kvs
VSBP3	3/4"	6.3	16.5	8,8	
VSBP4	1"	10	"	5,5	
VSBP5	1 1/4"	16	"	3,5	
VSBP6	1 1/2"	25	"	2,5	
VSBP8	2"	40	"	1,8	
VSBP2F	15	4	8,8	11	<ul style="list-style-type: none"> - flanged connections - fluid temperature -5T 95°C - leakage 0% Kvs
VSBP3F	20	6.3	16.5	8,8	
VSBP4F	25	10	"	5,5	
VSBP5F	32	16	"	3,5	
VSBP6F	40	25	"	2,5	
VSBP8F	50	40	"	1,8	

Valve Bodies

Series VSBPM (threaded) and VSBPMF (flanged). Modulating tight close-off valves - NP16 G25 cast iron. To be motorized by MVB5. actuators, see page 42

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFFERENTIAL PRESS bar	OTHER CHARACTERISTICS
VSBP2M	1/2"	4	8,8	11	- threaded connections - fluid temperature -5T 95°C - leakage 0% Kvs
VSBP3M	3/4"	6.3	16.5	8,8	
VSBP4M	1"	10	"	5,5	
VSBP5M	1 1/4"	16	"	3,5	
VSBP6M	1 1/2"	25	"	2,5	
VSBP8M	2"	40	"	1,8	
VSBP2MF	15	4	8,8	11	- flanged connections - fluid temperature -5T 95°C - leakage 0% Kvs
VSBP3MF	20	6.3	16.5	8,8	
VSBP4MF	25	10	"	5,5	
VSBP5MF	32	16	"	3,5	
VSBP6MF	40	25	"	2,5	
VSBP8MF	50	40	"	1,8	

Series VSBT NP16 - To be motorized by MVT actuators, see page 42.

MODEL	SIZE inch	Kvs	STROKE mm	MAX DIFF. PRESSURE bar		OTHER CHARACTERISTICS
					MVT	
VSBT3	3/4"	6,3	5,5		1,7	- linear control flow characteristics - leakage 0,03% Kvs - fluid temp. 5° to 95°C
VSBT4	1"	10	5,5		1	
VSBT5	1"1/4	13	5,5		0,7	
VSBT6	1"1/2	16	5,5		0,5	

2-way Single-seat, Globe Valve Bodies

Series VSG - SS - To be motorized by SH - MVL actuators, see pages 43, and ST402, see page 44.

MODEL	SIZE mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				SH-ST	MVL	MVL** A/C	
VSG (NP 16)	25 R	4	16,5	2 (10)	2 (10)	2(10)	- G 25 cast-iron body internal parts in bronze NP 16 flanged connections fluid temp.: - 10* to 150 °C - control flow characteristics equal-percentage - leakage 0.03% Kvs
	25 I	6,3	"	2 (10)	2 (10)	2(10)	
	25	10	"	2 (10)	2 (10)	2(10)	
	40	25	25	2(7,5)	2(9,5)	2(3,5)	
	50	40	"	2(4,7)	2(6)	2(2,4)	
	65	63	"	2(2,8)	2(3,6)	1,4	
	80	100	45	1,7	2(2,3)	0,8	
	100	130	"	0,8	1,4	0,4	
	125	200	"	0,5	0,8	-	
150	300	"	0,3	0,4	-		

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55)

** By spring return MVLA closed, MVLC open.

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.



Valve Bodies



2-way Single-seat, Globe Valve Bodies

Series VS - SS - To be motorized by SH - MVL actuators, see pages 43, and ST402, see page 44.

MODEL	SIZE mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				SH-ST	SH-MVL	MVL** A/C	
SSGA (NP 16)	15 R	1,6	16,5	6(16)	6(16)	6(16)	<ul style="list-style-type: none"> - G 25 cast-iron body internal parts in stainless steel NP 16 flanged connections fluid temp.: - 10* to 200 °C - Equal-percentage control flow characteristic - Leakage 0,02% Kvs
	15	4	"	6(16)	6(16)	6(16)	
	20	6,3	"	6(16)	6(16)	6(14)	
	25	10	"	6(16)	6(16)	6(9)	
	32	16	25	6(16)	6(16)	6(9)	
	40	24	"	6(10)	6(13,3)	5,5	
	50	32	"	6(7)	6(9)	3,5	
	65	63	"	2,5	3,5	1,4	
	80	110	45	1,5	2,3	0,9	
VSS (NP 25)	25 R	4	16,5	8(16)	8(20)	7(10)	<ul style="list-style-type: none"> - spheroidal cast-iron body internal parts in stainless steel NP 25 flanged connections fluid temp.: -10* to -230°C - Equal-percentage control flow characteristic - Leakage 0,02% Kvs
	25 I	6,3	"	8(16)	8(20)	7(10)	
	25	10	"	8(16)	8(20)	7(10)	
	32	16	25	7,5(10)	8(13)	5,5	
	40	25	"	7	7,5(9)	4	
	50	40	"	5	6,3	2,5	
	65	63	"	2,7	3,5	1,4	
SSAA (NP 40)	15 R	1,6	16,5	-	10(30)	10(30)	<ul style="list-style-type: none"> - Fe 52 steel body internal parts in stainless steel NP 40 flanged connections fluid temp.: - 10* to 230 °C - Equal-percentage control flow characteristic - Leakage 0,02% Kvs
	15	4	"	-	10(30)	10(20)	
	20	6,3	"	-	10(30)	10(12)	
	25	10	"	-	10(20)	7,5	
	32	16	25	-	10(20)	7,5	
	40	22	"	-	10(13)	4,5	
	50	32	"	-	8	3	
	65	70	"	-	3,5	1	
80	110	45	-	2,4	0,8		
SSAACP *** (NP 40)	15 R	1,6	16,5	-	10(30)	10(30)	<ul style="list-style-type: none"> - Fe 52-steel body with extended neck internal parts in stainless steel with greaser and special seals for high temperatures NP 40 flanged connections fluid temp.: - 20*** to 350°C - Equal-percentage control flow characteristic - Leakage 0,02% Kvs
	15	4	"	-	10(30)	10(17)	
	20	6,3	"	-	10(30)	10	
	25	10	"	-	10(20)	6,8	
	32	16	25	-	10(20)	6,8	
	40	22	"	-	10(13)	4,3	
	50	32	"	-	8	2,8	
	65	70	"	-	3,5	1	
80	110	45	-	2,3	0,8		

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55).

** VSS: by spring return MVLA closed, MVLC open. SS: by spring return MVLA open, MVLC closed.

*** For fluid applications with temperature below -10 °C, when ordering, add "B" to model, e.g. SSAACP40B.

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.

Valve Bodies

2-way Balanced Plug Valves

Series VBG-VBGA-VBS-VBAA. To be motorized by SH-MVL actuators, see page 43 and ST402, see page 44.

MODEL	DN	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				MVL	SH-ST	MVL** A/C	
VBG (NP 16)	65	63	25	2(16)	2(16)	2(13)	<ul style="list-style-type: none"> - G25 cast iron body, brass plug - NP 16 flanged connections - Fluid temp.: -10* to 150°C - Equal-percentage control characteristic - Leakage 0,03% Kvs
	80	100	45	2(16)	2(16)	2(10)	
	100	130	"	2(16)	2(16)	2(8)	
	125	200	"	2(16)	2(13,5)	2(5,5)	
VBS (NP 25)	25R	4	16,5	8(25)	8(25)	8(25)	<ul style="list-style-type: none"> - Spheroidal cast iron body - Stainless steel internal parts - NP 25 flanged connections - Fluid temp.: -10* to 230°C - Equal-percentage control characteristic - Leakage 0,02% Kvs
	25I	6,3	"	8(25)	8(25)	8(25)	
	25	10	"	8(25)	8(25)	8(25)	
	32	16	25	8(25)	8(25)	8(25)	
	40	25	"	8(25)	8(25)	8(25)	
	50	40	"	8(25)	8(25)	8(25)	
	65	63	"	8(25)	8(25)	8(22)	
VBAA (NP 40)	25	10	16,5	12(30)	12(30)	12(30)	<ul style="list-style-type: none"> - Steel body and stainless steel internal parts - NP40 flanged connections - Fluid temp.: -20* to 230°C - Equal-percentage control characteristic - Leakage 0,02% Kvs
	32	16	25	12(30)	12(30)	12(30)	
	40	25	"	12(30)	12(30)	12(30)	
	50	40	"	12(30)	12(30)	12(30)	
	65	63	"	12(30)	12(30)	12(22)	
	80	100	45	12(30)	12(30)	12(18)	
	100	160	"	12(28)	12(22)	11	
125	200	"	12(22)	12(17)	8		

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55).

** By spring return MVLA close, MVLC open.

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.

2-way Double-seat Globe Valves

Series DS - To be motorized by SH - MVL actuators, see page 43.

MODEL	DN	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				SH-ST	MVL	MVL** A/C	
DSGA (NP 16)	200	500	45	-	8(9)	-	<ul style="list-style-type: none"> - G25 cast iron body, stainless steel internal parts - NP 16 flanged connections - Fluid temp.: -10* to 200°C - Equalpercentage control characteristic - Leakage 0,12% Kvs
DSAA (NP 40)	150	300	45	-	12(14)	7	<ul style="list-style-type: none"> - Fe 52 Steel body and stainless steel internal parts - NP40 flanged connections - Fluid temp.: -10* ÷ 230°C - Equalpercentage control characteristic - Leakage 0,12% Kvs

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55).

** By spring return MVLA open, MVLC close.

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.



field devices

Valve Bodies



3-way Globe Valves

Series VMB (threaded) - VMBF (flanged) - NP 16. To be motorized by MVB - SH - MVL actuators, see pages 42-43. VSB-VMB series is also available with stainless steel plug. For part number and prices, please contact our export sales dept.

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				MVB	SH-MVL	MVL A/C	
VMB11	1/2"R	1	16,5	2 (10)	2 (10)	2 (10)	<ul style="list-style-type: none"> - Brass valve body for DN 1/2", G 25 cast-iron body for DN 3/4"-2" - Brass internal parts - Female threaded connections - Fluid temp: -10÷150 °C (with MVB max 120 °C, with MVB+MVBHT max 140 °C) - Control characteristic: equal-percentage on direct way, linear on angle way. - Leakage 0.03% Kvs - For MVL actuator add AG31 - For SH - ST actuators add AG21
VMB1	1/2"R	1,6	"	2 (10)	2 (10)	2 (10)	
VMB15	1/2"R	2,5	"	2 (10)	2 (10)	2 (10)	
VMB2	1/2"	4	"	2 (10)	2 (10)	2 (10)	
VMB3	3/4"	6,3	"	2 (10)	2 (10)	2 (10)	
VMB4	1"	8	"	2 (6,5)	2 (10)	2 (10)	
VMB5	1"1/4	16	"	2 (4)	2 (10)	2 (10)	
VMB6	1"1/2	22	"	2 (2,5)	2(8)	2 (4)	
VMB8	2"	30	"	2	2 (6)	2 (3)	
VMB8A	2"	40	"	2	2 (6)	2 (3)	
VMB11F	15 R	1	"	2 (10)	2 (10)	2 (10)	as above but with slip-on flanges NP16 VMB9F linear control characteristic
VMB1F	15 R	1,6	"	2 (10)	2 (10)	2 (10)	
VMB15F	15 R	2,5	"	2 (10)	2 (10)	2 (10)	
VMB2F	15	4	"	2 (10)	2 (10)	2 (10)	
VMB3F	20	6,3	"	2 (10)	2 (10)	2 (10)	
VMB4F	25	8	"	2 (6,5)	2 (10)	2 (10)	
VMB5F	32	16	"	2 (4)	2 (10)	2 (10)	
VMB6F	40	22	"	2 (2,5)	2 (8)	2 (6)	
VMB8F	50	30	"	2	2 (6)	2 (8)	
VMB8AF	50	40	"	2	2 (6)	2 (8)	
VMB9F*	65	63	20	1,6	-	-	

() Max close-off differential pressure by closed valve.

* motorized only with MVB

3-way Tight Close-off Valves

Series VMBP (threaded) - VBMPF (flanged). Tight close-off on/off valves NP 16. To be motorized by MVB2.-4. actuators, see page 42.

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar		OTHER CHARACTERISTICS
				DIRECT WAY	ANGLE WAY	
VMBP2	1/2"	4	8,8	11	5,5	<ul style="list-style-type: none"> - G25 cast iron valve body - Fluid temperature -5 to 95°C - Leakage 0% Kvs
VMBP3	3/4"	6,3	16,5	8,8		
VMBP4	1"	10	"	5,5		
VMBP5	1 1/4"	16	"	3,5		
VMBP6	1 1/2"	25	"	2,5		
VMBP8	2"	40	"	1,8		
VMBP2F	15	4	8,8	11	5,5	as above with flanged connections
VMBP3F	20	6,3	16,5	8,8		
VMBP4F	25	10	"	5,5		
VMBP5F	32	16	"	3,5		
VMBP6F	40	25	"	2,5		
VMBP8F	50	36	"	1,8		

Valve Bodies

Series VMBPM (threaded) - VBMPMF (flanged). Tight close-off modulating valves NP 16. To be motorized by MVB5. actuators, see page 42.

MODEL	SIZE inch mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar		OTHER CHARACTERISTICS	
				DIRECT WAY	ANGLE WAY		
VMBP2M	1/2"	4	8,8	11	5,5	- G25 cast iron valve body - Fluid temperature -5 to 95°C - Leakage 0% Kvs	
VMBP3M	3/4"	6.3	16.5	8,8			
VMBP4M	1"	10	"	5,5			
VMBP5M	1 1/4"	16	"	3,5			
VMBP6M	1 1/2"	25	"	2,5			
VMBP8M	2"	40	"	1,8			
VMBP2MF	15	4	8,8	11	5,5		as above with flanged connections
VMBP3MF	20	6.3	16.5	8,8			
VMBP4MF	25	10	"	5,5			
VMBP5MF	32	16	"	3,5			
VMBP6MF	40	25	"	2,5			
VMBP8MF	50	36	"	1,8			

Series VMBT NP 16 - To be motorized by MVT actuators, see page 42.

MODEL	SIZE	Kvs	STROKE mm	MAX DIFF. PRESSURE bar		OTHER CHARACTERISTICS
				MVT		
VMBT3	3/4"	6.3	5.5	1.7		- G25 cast iron body - Fluid temperature 5 to 95 °C - Linear control characteristic - Leakage: direct way 0.03% Kvs angle way < 2% Kvs
VMBT4	1"	10	5.5	1		
VMBT5	1 1/4"	13	5.5	0.7		
VMBT6	1 1/2"	16	5.5	0.5		

3-way Globe Valves

Series VM - 3V - To be motorized by MVL - SH actuators, see page 43, and ST402, see page 44.

MODEL	SIZE mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS
				SH-ST	MVL	MVL** A/C	
VMB16 (NP 16)	25 R	4	16,5	2 (10)	2 (10)	2 (8)	- G 25 cast-iron body brass internal parts NP 16 flanged connections - Fluid temp.: - 10* to 150 °C - Control flow characteristic: direct-way: equal-percentage angle way: linear - Leakage: direct-way: 0.03% Kvs angle way: 2% Kvs
	25 I	6,3	"	2 (10)	2 (10)	2 (8)	
	25	10	"	2 (10)	2 (10)	2 (8)	
	40 R	19	25	2 (8)	2 (10)	2 (4)	
	40	25	"	2 (8)	2 (10)	2 (4)	
	50	40	"	2 (5)	2 (6.7)	2 (2.6)	
	65	63	"	2 (3)	2 (4)	1.5	
	80	100	45	1,8	2(2.4)	0.9	
	100	130	"	1	1.5	0.5	
	125	200	"	0.6***	0.9	0.25	
150	300	"	0.4***	0.5	0.15		

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55).

** By spring return MVLA closed direct way, MVLC open

*** For ST only

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.



Valve Bodies



3-way Globe Valves

Series VM - 3V - To be motorized by MVL - SH actuators, see page 43, and ST402, see page 44.

MODEL	SIZE mm	Kvs	STROKE mm	MAX DIFF. PRESSURE bar			OTHER CHARACTERISTICS	
				SH-ST	MVL	MVL** A/C		
VMS (NP 25)	25 R	4	16,5	8(16)	8(20)	7(10)	<ul style="list-style-type: none"> - G-308 spheroidal cast-iron body stainless steel internal parts - NP 25 flanged connections - Fluid temp.: -10* to 230°C - Control flow characteristic: equal percentage (DN25÷65) linear (DN80), angle way linear - Leakage 0.02% Kvs 	
	25 I	6,3	"	8(16)	8(20)	7(10)		
	25	10	"	8(16)	8(20)	7(10)		
	32	19	25	7,5(10)	8(13)	5,5		
	40	25	"	7	7,5	4		
	50	40	"	5	6,3	2,5		
3VSA (NP 25)	65	63	"	2,7	3,5	1,4		
	80	100	45	1,5	2	0,8		
VMSTS (NP 25)	25 R	4	16,5	-	5	5		<ul style="list-style-type: none"> - G 308 spheroidal cast-iron body stainless steel internal parts with bellows seal - NP 25 flanged connections - Fluid temp.: -10* to 300 °C - Control flow characteristic: equal percentage (DN25÷65) linear (DN80), angle way linear - Leakage 0,02% Kvs
	25 I	6,3	16,5	-	5	5		
	25	10	"	-	5	5		
	32	19	25	-	5	4		
	40	25	"	-	5	2,5		
	50	40	"	-	5	1,5		
3VSATS (NP 25)	65	63	"	2,5	3	1		
	80	100	45	1,5	2	0,5		
3VAA (NP 40)	25 R	4	16,5	-	10(20)	7,5	<ul style="list-style-type: none"> - Fe 52 steel body stainless steel internal parts - NP 40 flanged connections - Fluid temp.: -10* to 230 °C - Control flow characteristic: linear - Leakage 0,02% Kvs 	
	25 I	6,3	"	-	10(20)	7,5		
	25	10	"	-	10(20)	7,5		
	32	16	25	-	10(13)	4,5		
	40	22	"	-	8,5	3		
	50	32	"	-	5,5	2		
	65	70	"	-	3,5	1		
	80	110	45	-	2	0,7		
	100	140	"	-	1,3	0,4		
3VAACP (NP 40)	125	250	"	-	0,8	0,2		<ul style="list-style-type: none"> - Fe 52 steel body internal parts in AISI 316 stainless steel with grease-cap and special seals for high temperature - NP 40 flanged connections - Fluid temp.: - 20*** to 350 °C - Control flow characteristics: linear - Leakage 0,02% Kvs
	25 R	4	16,5	-	10(20)	6,8		
	25 I	6,3	"	-	10(20)	6,8		
	25	10	"	-	10(20)	6,8		
	32	16	25	-	10(12)	4,3		
	40	22	"	-	8	2,8		
	50	32	"	-	5,5	2		
	65	70	"	-	3,5	1		
	80	110	45	-	2	0,7		
100	140	"	-	1,3	0,4			
125	250	"	-	0,8	0,2			

() Max close-off differential pressure by closed valve.

* For applications with eventual ice formation on stem and packing, use the stem heater (see page 55).

** By spring return MVLA closed direct way, MVLC open

*** For fluid applications with temperature below -10 °C, when ordering, add "B" to model, e.g. 3VAACP40B

Options for valve bodies: see page 55.

Pressure drop diagrams, see pages 59-60.

Valve Bodies

Valve Options

MODEL	DESCRIPTION
A150-2	flanges with ANSI 150 bolt holes for VSG,VBS, SS, DS valves
A150-3	flanges with ANSI 150 bolt holes for 3V, VMB16 valves
A300-2	flanges with ANSI 300 bolt holes for SSAA and DSAA valves
A300-3	flanges with ANSI 300 bolt holes for 3VAA valves

Accessories for Valve Bodies

(Supplied separately from the valve body, mounting on behalf of the customer)

MODEL	DESCRIPTION
AG21	mounting kit for SH - ST on VSB - VSB-F - VMB - VMB-F (pages 48, 52)
AG31	mounting kit for MVL on VSB - VSB-F - VMB - VMB-F (page 48, 52)
AG40	mounting kit for MVB on VB7200/7300
AG50	mounting kit for MVF on VMB16-VSG-VBG valves (pages 53, 49, 51)
AG51	mounting kit for MVF on other Controlli flanged valves (pages 50-54)
AG52	mounting kit for MVF on V.B threaded valves (pages 48, 52)
244	stem heater for VSB/VSB-F- VMB/VMB-F valves motorized by MVB actuator, supply 24 V a.c.
245	as above for all valves, except V.B, motorized by SH, ST, MVL actuators, supply 24 V a.c.
246	as above for VSB/VSB-F- VMB/VMB-F valves, motorized by SH, MVL actuators - supply 24 V a.c.
247	stem heater for MVF actuator

Valve Bodies



Butterfly Valves

Series VF - To be motorized by ST 404/405, see page 44 or MDL, see page 41. The valves are already pre-set for mounting on ST400 actuators, for MDL, see AF22.

MODEL	SIZE	Kvs	MAX DIFFERENTIAL PRESSURE kPa WITH ST 405 and MDL ACTUATORS	OTHER CHARACTERISTICS
VFG10 (NP 10)	40	85	200	- G 25 cast-iron valve body connections: for UNI NP10 counterflanges - Fluid temp.: 120 °C max - Leakage: 1% Kvs
	50	130	200	
	65	220	200	
	80	340	200	
	100	550	150	
	125	900	100	
	150	1400	70	
	200	2500	40	

Linkage Kit for Butterfly Valves with MDL Actuators

MODEL	CHARACTERISTICS
AF22	linkage kit and strain release mechanism with position indicator for MDL actuator (mounting is factory-made only)
MDLAV	MDL assembly on VFG 10 valve

Shoe Valves

Series M - Cast-iron NP 6 - To be motorized by: ST 404/405 actuators fitted with AM62 linkage, see page 44.



MODEL	SIZE	Kvs	MAX DIFFERENTIAL PRESSURE kPa WITH ST404 / ST405 ACTUATORS	OTHER CHARACTERISTICS
M3 (NP 6)	1"	30	100	THREE-WAY NP 6 cast-iron valve body - Female threaded connections Outlet from angle-way - Fluid temp.: 110 °C max
	1 1/4"	37	100	
	1 1/2"	38	100	
	2"	45	100	
M3 (NP 6)	40	38	100	as above but with flanged connections
	50	70	100	
	65	80	80	
	80	90	50	
	100	110	30	
M4 (NP 6)	1"	30	100	FOUR-WAY NP 6 cast-iron valve body female threaded connections Fluid temp.: 110 °C max
	1 1/4"	37	100	
	1 1/2"	40	100	
	2"	45	100	
M4 (NP 6)	50	70	100	as above but with flanged connections
	65	80	80	
	80	90	50	
	100	110	30	

Linkages for non-CONTROLLI Shoe Valves

Series AM - Linkage composed of bracket and accessories - Supplied separately from the valve body.

MODEL	CHARACTERISTICS
AM58	for shoe valves with Ø 12mm shaft, e.g. Excelsior-Buche - Landis - Lazzari - Besser

The AM58 model for valves not supplied by Controlli must be considered as indicative. Please contact our sales support to check if mounting is possible according to the shape, thickness and dimensions of the shaft belonging to the valve to be motorized.

2-way Globe Valves Selection Chart

MODEL	NP	DN	ACTUATOR			FLUID TEMPERATURE	
			ON/OFF	FLOATING	PROPORTIONAL	MAX °C	MINIMUM °C
SIMPLE SEAT							
Motorized valves*							
VSE	16	1/2"÷1"	230 Vca			93	0
Valve bodies to be assembled with the actuator**							
VST	16	1/2"÷3/4"		MVT4.	MVT5.	95	5
VSX	16	1/2"÷3/4"	MX21/41		MX57	95	5
VSXT	16	1/2"÷3/4"		MVT4	MVT5.	95	2
VSZ	16	1/2"÷3/4"	MVA2./4		MVA4.	95	5
VSBT	16	3/4"÷1 1/2"		MVT4	MVT5.	95	5
VSB	16	1/2"÷2"		MVB2./4***	MVB36/5.***	150	-10
VSBF	16	15÷65		MVB2./4***	MVB36/5.***	150	-10
VSBP	16	1/2"÷2"	MVB2./4***			95	-5
VSBPF	16	15÷65	MVB2./4***			95	-5
VSBPM	16	1/2"÷2"		MVB2./4***	MVB36/5.***	95	-5
VSBPMF	16	15÷65		MVB2./4***	MVB36/5.***	95	-5
VSG	16	25÷150				150	-10
SSGA	16	15÷100		MVF54/58 SH222/242 MVL26/46/66	MVF54/58 SH5.. MVL56	200	-10
VSS	25	25÷65				230	-10
SSAA	40	15÷80				230	-10
SSAACP	40	15÷80				350	-20
BALANCED PLUG							
VBG	16	65÷150		MVF54/58 SH222/242 MVL26/46/66	MVF54/58 SH5.. MVL56	150	-10
VBS	25	25÷80				230	-10
VBAA	40	25÷125				230	-20
DOUBLE SEAT							
DSGA	16	200		MVF54/58 SH222/242 MVL26/46/66	MVF54/58 SH5.. MVL56	200	-10
DSAA	25	150				230	-10

Note:

- * **Motorized valves** are supplied already mounted on the actuator.
- ** **The valve bodies can be assembled on different actuator models**, as indicated in the table. VSXT, VSZ, VSBT valve bodies are supplied separately from the actuators (MVA-MVT). All the other valve bodies can be supplied individually or mounted on the actuator. If assembled valves are required, when ordering fill in the valve model, the actuator model and the code indicating the valve-actuator assembly.
- *** In applications with MVB actuator with fluid having a temperature higher than 120°C, add the MVBHT spacer.

For max differential pressure values, according to the DN and the actuator, see:

- page 45 VSX valve bodies
- page 46-47 VST, VSXT, VSZ, VSE valve bodies
- page 48 VSB, VSBF, VSBP, VSBPF valve bodies
- page 49 VSBPM, VSBPMF, VSBT, VSG, valve bodies
- page 50 SSGA, VSS, SSAA, SSAACP valve bodies
- page 51 VBG, VBS, VBAA, DSGA, DSAA valve bodies

Valve Bodies

3-way Globe Valves Selection Chart

MODEL	NP	DN	ACTUATOR			FLUID TEMPERATURE	
			ON/OFF	FLOATING	PROPORTIONAL	MAX °C	MINIMUM °C
Motorized valves*							
VDE	16	1/2"÷1"	230 Vca			93	0
Valve bodies to be assembled with the actuator**							
VMT-VTT	16	1/2"÷3/4"		MVT4	MVT5.	95	2
VMX-VTX	16	1/2"÷3/4"	MX21/41		MX57	95	5
VMXT-VTXT	16	1/2"÷3/4"		MVT4	MVT5.	95	2
VMZ-VTZ	16	1/2"÷3/4"	MVA2./4		MVA4.	95	2
VMBT	16	3/4"÷1 1/2"		MVT4	MVT5.	95	5
VMB	16	1/2"÷2"		MVB2./4***	MVB36/5.***	150	-10
VMBF	16	15÷65		MVB2./4***	MVB36/5.***	150	-10
VMBP	16	1/2"÷2"	MVB2./4***			95	-5
VMBPF	16	15÷65	MVB2./4***			95	-5
VMBPM	16	1/2"÷2"		MVB2./4***	MVB36/5.***	95	-5
VMBPMF	16	15÷65		MVB2./4***	MVB36/5.***	95	-5
VMB16	16	25÷150				150	-10
VMS	16	25÷65				230	-10
VMSTS	25	25÷65		MVF54/58 SH222/242 MVL26/46/66	MVF54/58 SH5.. MVL56	300	-10
3VSA	25	80				230	-10
3VSATS	25	80				230	-10
3VAA	40	25÷125****				300	-10
3VAACP	40	25÷125****				350	-20

Note:

- * **Motorized valves** are supplied already mounted on the actuator.
- ** **The valve bodies can be assembled on different actuator models**, as indicated in the table. VMXT, VTX, VMT, VTT, VMZ, VTZ, VMBT valve bodies are supplied separately from the actuators (MVA-MVT). All the other valve bodies can be supplied individually or mounted on the actuator. If assembled valves are required, when ordering fill in the valve model, the actuator model and the code indicating the valve-actuator assembly.
- *** In applications with MVB actuator with fluid having a temperature higher than 120°C, add the MVBHT spacer.
- **** 3VAA125 and 3VAACP125 have NP25

For max differential pressure values, according to the DN and the actuator, see:

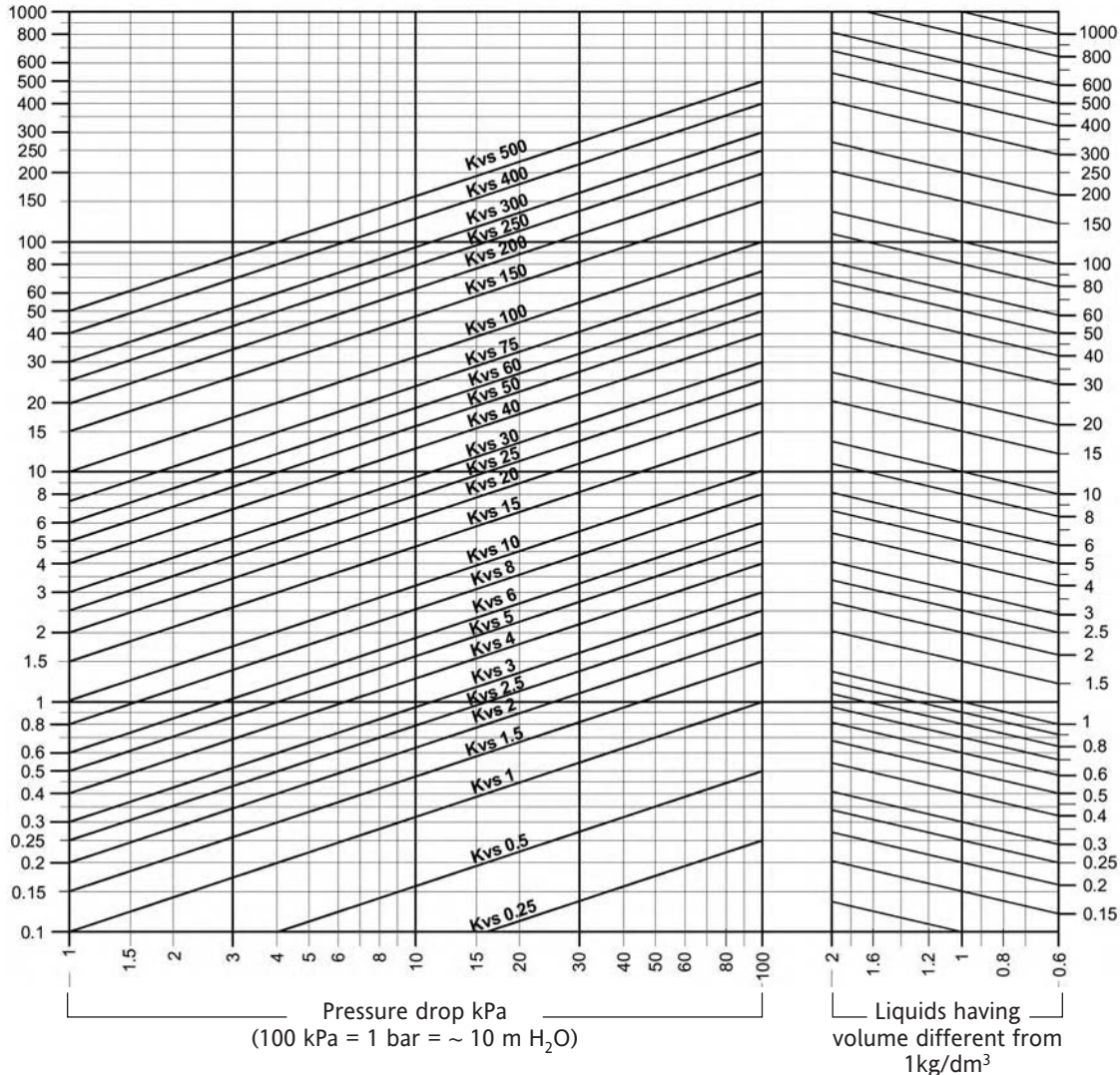
- page 45 VMX-VTX motorized valves
- page 46-47 VMT, VTT, VMXT, VTXT, VMZ,VTZ, VDE valve bodies
- page 52 VMB, VMBF, VMBP, VMBPF valve bodies
- page 53 VMBPM, VMBPMF, VMBT, VMB16 valve bodies
- page 54 VMS, 3VSA, 3VAA, VMSTS, 3VSATS, 3VAACP valve bodies

Valve Sizing Diagram for Fluids

$$KVs = \frac{Q \cdot 10}{\sqrt{\Delta p_v}} \quad \begin{array}{l} Q = \text{flow rate in m}^3/\text{h} \\ \Delta p_v = \text{pressure drop (kPa)} \end{array}$$

Water flow rate in m³/h

Flow rate in m³/h



NOTE: The recommended valve pressure drop must be at least equal to the load.

Example for fluids with specific gravity 1 kg/dm³ (water)

In order to size a control valve with:

FLOW RATE: 7.5 m³/h of water

PRESSURE DROP: 55 kPa

Use the diagram as follows:

- Identify the crossing point between the line starting from the flow rate value (7.5 m³/h) and the line from pressure drop value (55 kPa).

This point corresponds to the required flow coefficient: Kvs 10. Therefore, the control valve must have Kvs = 10.

Example for fluids with specific gravity different than 1 kg/dm³

In order to size a control valve with:

FLOW RATE: 150 m³/h of liquid having 0.9 kg/dm³ specific gravity

PRESSURE DROP: 80 kPa

Use the diagram as follows:

- Identify the crossing point (right side of diagram) between the line starting from the specific gravity value 0.9 kg/dm³ and the inclined line starting from the flow rate value (150 m³/h).

- Identify the crossing point between the horizontal line starting from the crossing point above and the vertical line starting from the pressure drop value 80 kPa.

This point corresponds to flow rate coefficient (Kvs 160).

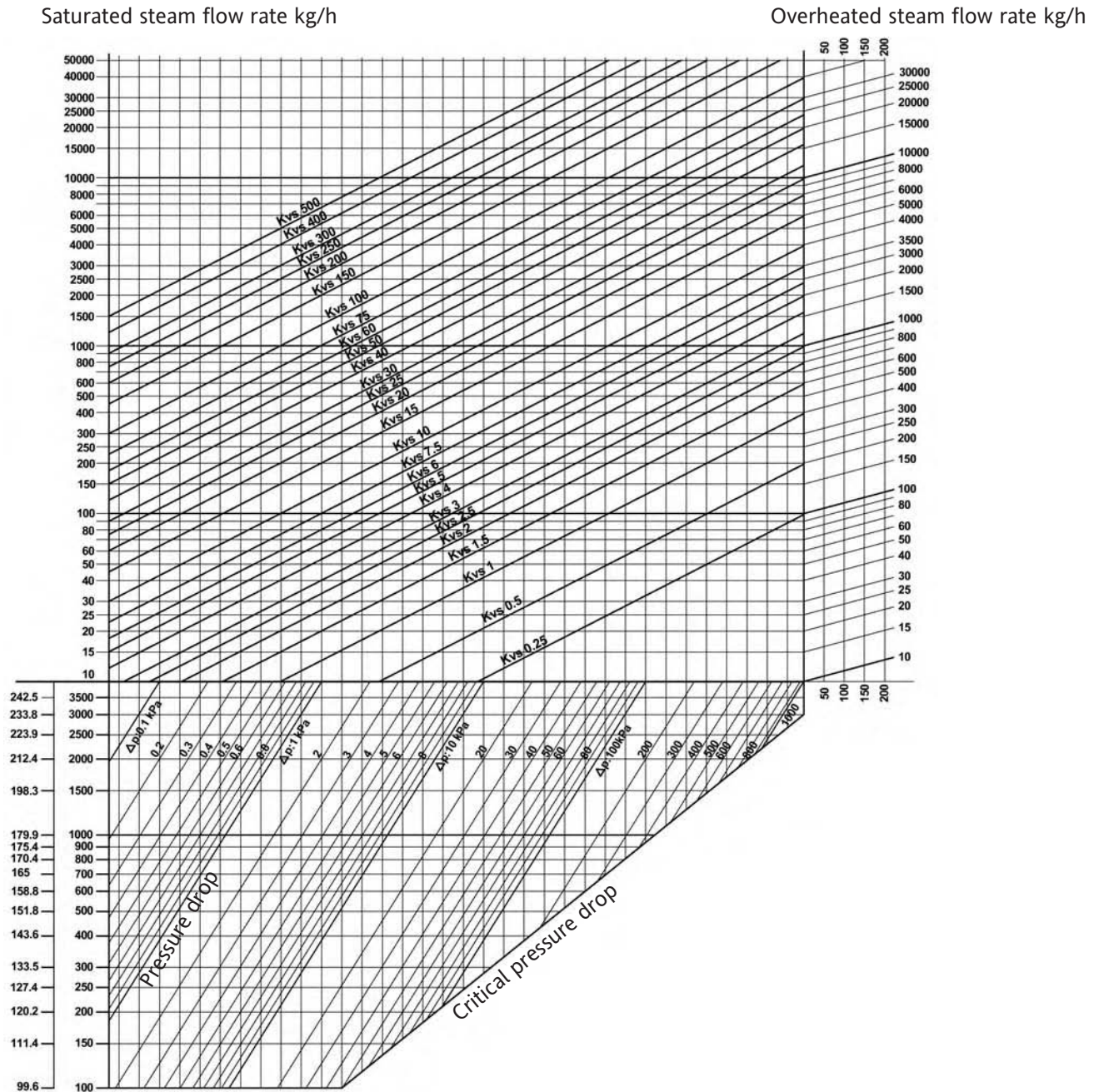
Example for diathermic oil

It could be convenient to size the valve on diathermic oil using the water diagram. To do this it is necessary to apply the following conversion formula, which takes into account the mass and specific "average" heat of diathermic oil:

$$Q = \frac{K \text{ calories}}{\Delta t 500} \text{ in m}^3/\text{h} = \text{water}$$

field devices

Valve Sizing Diagram for Steam



Example for saturated steam:

FLOW RATE: 4700 kg/h saturated steam
 ABSOLUTE PRESSURE UPSTREAM: 850 kPa
 PRESSURE DROP: 160 kPa

Use the diagram as follows

- Identify the crossing point between the line starting from absolute pressure upstream value (850 kPa) and the inclined line corresponding to 160 kPa pressure drop.
- Identify the crossing point between the line starting from the crossing point above and the line of 4700 kg/h flow rate.

This point corresponds to the flow coefficient: Kvs 63.

Example for overheated steam:

FLOW RATE: 140 kg/h overheated steam
 ABSOLUTE PRESSURE UPSTREAM: 350 kPa
 TEMPERATURE: 209 °C
 PRESSURE DROP: 100 kPa

Calculate the overheating degree of steam as follows:

- Read the temperature value corresponding to 350 kPa absolute pressure (139 °C).
- The overheating degree is: 209 - 139 = 70 °C
- Identify the crossing point "A" (right side of the diagram) between the line starting from the overheating value (70 °C) and the inclined line of 140 kg/h flow rate.
- Identify the crossing point "B" between the line starting from 350 kPa pressure upstream and the inclined line corresponding to 100 kPa pressure drop.
- Identify the crossing point between the two lines starting from point "A" and "B".

How to Calculate Kvs

Flow coefficient Kvs is the flow rate of water in m³/h passing through a fully open valve, with a 100 kPa pressure drop.

$$a) \text{ liquids } Kvs = 10 \times Q \times \sqrt{\frac{\rho}{\Delta p}}$$

Q = flow rate (m³/hr)

Δp = pressure drop (kPa)

ρ = specific gravity(kg/dm³)

The Δp pressure drop should be determined as follows:

- Equal or higher than the Δp of the circuit under control in case of variable flow application
- Equal or higher than the Δp of the supply circuit in case of constant flow applications

$$b) \text{ steam } Kvs = \frac{100 \times G \times C}{20,3 \sqrt{p_2 \times \Delta p_v}}$$

G = flow rate (kg/h)

C = 1 + 0,0013 (t-ts)

t = steam temperature in working conditions

ts = saturated steam temperature at pressure P₂

P₂ = pressure downstream (kPa)

Δp_v = pressure drop (kPa)

Choose the valve with the Kvs closest to the calculated one.

Water System

Two-way valve

For this application, the pressure drop through the valve must be high, in order to have a good control flow characteristic and a properly working system.

- 1) The valve pressure drop must be 30 to 50% of the pressure upstream the valve.
- 2) The valve pressure drop must be equal to, or higher than the pressure drop of the coil or heat exchanger under control, in particular:

temperature drop of heat exchanger

30 °C

20 °C

10 °C

design of valve pressure drop

equal to pressure drop of heat exchanger

twice as pressure drop of heat exchanger

three times as pressure drop of heat exchanger

3-way mixing valve

For mixing valve a high pressure drop is not normally required even when used in primary and secondary water circuits to control supply temperature to users.

As a general rule, the valve must have a pressure drop similar to the one of the heat exchanger.

3-way diverting valve

3-way diverting valves are used to control flow to heat exchanger and, therefore, the pressure drop through the valve. For proportional systems, it must be high.

Note: When selecting pressure drop, you must not exceed the above-mentioned values because an undersized valve could produce:

- noisy operation and vibration of the plug
- rapid wear of plug and seat due to high speed of the fluid through the valve.

Overheated Water System

For this application the valves can be two or three-way types.

The valve pressure drop must be high, in order to have a good control flow characteristic and a properly working system.

The principles and rules for correct sizing are the same as "WATER SYSTEMS".



Steam Systems

For low pressure steam systems (up to 2 bar), the pressure drop through the valve must be from 60 to 80% of the pressure available upstream the valve.

steam pressure upstream the valve	valve pressure drop
--	----------------------------

0.5 bar 50 kPa,	40 kPa
-----------------	--------

1.0 bar 100 kPa	70 kPa
-----------------	--------

For high pressure steam systems (above 2 bar), the pressure drop through the valve must be from 30 to 40% of the pressure available upstream the valve.

steam pressure upstream the valve	valve pressure drop
--	----------------------------

200 kPa	80 kPa
---------	--------

600 kPa	200 kPa
---------	---------

1000kPa	300 kPa
---------	---------

For on/off valves there are no particular rules to follow, pressure drop may be 10 to 20 % of inlet pressure, but the valve is normally pipe sized.

Note: Do not size valve for high pressure steam with pressure drop higher than 50% of absolute pressure upstream: beyond this percentage thermodynamic problems could affect valve efficiency and life.

Diathermic Oil Systems

The most common valve type used is three-way with linear characteristic, in order to ensure a constant flow to the boiler by constant speed.

Two-way valves can be used for several low-power users and, where a balanced plug valve is mounted, between supply and return boiler.

The pressure drop of three-way valves must be at least equal to or higher than the one of the heat exchanger.

For a single user control, the valve must have a pressure drop from 30 to 50% of pressure drop of system.

For two-way valves, see the "WATER SYSTEMS" section.

A

A150/300	55
AF22	56
AG	55
AS205/206/207	6
AX236	12
AX526/527/536/537	19
AXCU	12
AXCU/BA	12

B

B301÷304	7
B301X÷304X	7
B351÷354	9
B351X÷354X	9
BD297	7

C

C307/C309	6
C357/C359	9
CM511	19
CP8551/CP8552	19
CTX	13
CX500	13

D

D5	44
D36	44
D41	42
D77	44
DG500 series	34
DG7000 series	28
DG7ROUT	28
DIGISTAT	12
DMDB	40
DMDL	41
DMVF	44
DMVL	44
DSAA/DSGA	51
DURADRIVE	40

F

F1	15
FG601÷604	7
FG651÷654	9

G

G1	6-9
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I

IZA/IZB/IZV	19
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K

KX436	15
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L

LIBO-4-485	28
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M

M3/M4	56
MA4x	40

MDB	40
MDL	41
MDLA1/2	41
MDLAV	41
MDLPA	41
MDLS5/V5	41
MF4x	40
Micra	45
MS4x	40
MVA	42
MVB	42
MVBAV	42
MVBC/MVBD/MVBHT	44
MVBPA2	44
MVF	43
MVL	43
MVLF	43
MVLHT	44
MVLP2/4/4M/6	44
MVT	42
MXV	45

N

NC7311	28
NR7000	29
NRMR7000	29
NS71÷74	28

O

OMNIA	18
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P

P1000-1	44
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R

R1	6-9
RA733/734	25
RM500	18
RM55L	35
RM77/RMS77	28

S

SBA/SBC/SBD/SBE/SBF/SBV	38
SH	43
SNTC/SNTC-S	12
SPC	13
SPTC	18-38
SPTX	38
SSAA/SSAACP/SSGA	50
ST402/4/5	44
STA71	28-38
STA71L/STA75L	35
STA75S/STA80S	28-38
STC71L	35
STD71L	35
STE71L/STES71L	35
STF71L	35
STR71	28-38
STR72	25-38
STR73	38

T

TL51	19
TPC	13
TP	39
TQ	39

TT	39
TU/TUT	39
TX283	13
TX581/586	13

U

UF215/217	6
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V

VBAA	51
VBG	51
VBS	51
VDE	47
VFG10	56
VMB/VMBF	52
VMBP/VMBPF	52
VMBPM/VMBPMF/VMBT	53
VMB16	53
VMS/VMSTS	54
VMXT	46
VMX	45
VMZ	47
VSB/VSBF	48
VSBP/VSBPF	48
VSBPM/VSBPMF/VSBT	49
VSG	49
VSE	47
VSS	50
VSXT	46
VSX	45
VSZ	47
VTXT	46
VTX	45
VTZ	47
VXC	45

W

W500H	18
W500T	18

Y

Y102/Y103	7
Y111/Y111RM	6
YS7	41
YTC3/3RM	6
YZB	6

2

244/245/246/247	55
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3

3VAA/3VAACP	54
3VSA/3VSATS	54

4

421	13-38
422	38



ACTIVITY

CONTROLLI was established in Genoa in 1936 and was the first Italian producer to supply a complete range of controllers, actuators and control valves for heating and air-conditioning systems.

Since 1950 the product range was improved by widening the range of control equipment and systems for industrial application.

In the eighties CONTROLLI consolidates its position as the most important Italian manufacturer, with special regard to environmental comfort, thanks to the development of analogue and digital electronic devices.

In the nineties CONTROLLI gains a position also in the Building Automation market.

From 1996 to July 2005 CONTROLLI has been part of the Invensys multinational group.

Since August 2005, CONTROLLI is merged to the TAC multinational group, with a combined company revenue of over 850\$ million, with the backing of a parent company like Schneider Electric, the world's leading power and control specialist.

CONTROLLI core business is represented by products and systems for the control and supervision of HVAC plants and industrial process.

RESEARCH & DEVELOPMENT MANAGEMENT

CONTROLLI devices are the product of mechanical - electrical - electronical technology integration, supported by a 70-year experience in HVAC applications.

PRODUCTION MANAGEMENT

An industrial complex of 6.000 m² in Sant'Olcese (Genoa) is CONTROLLI head office. Production is highly automated with robotic devices for the assembly and calibration of mechanical and electronic spare parts and finished products.

It is worth mentioning the robotic plant for processing, mounting and testing of valve bodies and the robotized workcell for assembly, testing and certification of fan-coil valve actuators.

CONTROLLI has adopted the SIX SIGMA procedures, further elevating the quality standard of its products.

Since 1994 CONTROLLI operates under ISO9001-9002 Quality Certificate System and all CONTROLLI valves are PED (Pressure Equipment Directive) compliant.

SALES AND MARKETING MANAGEMENT

Sales & Marketing Dept. is in Sant'Olcese (Genoa).

Italian sales network consist of Sales-Offices in Milan, Genoa and Rome, 45 representatives and 75 authorized dealers throughout the Italian territory.

Abroad CONTROLLI operates through a widespread network of distributors and dealers in almost all European countries, in the United States and Canada, in the Far East and in South America.

By getting in touch with the nearest CONTROLLI sales point, the customers can find a solution to any technical and commercial issue.

In particular, a proper service of technical assistance offers support for systems and devices, application information, quotations and wiring diagrams.

Moreover, CONTROLLI holds periodically training courses for different levels of technical expertise and class of customers.

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