

# Process Controller 1/4 DIN - 96 x 96 mm Dual-loop - QD line Controller - Programmer QP line

### The Hardware Package

2 analog inputs, 1 remote set input, 3 logic inputs, 2 control outputs, 4 auxiliary relay outputs, 2 logical outputs, 1 retransmission and RS485 Modbus-Jbus communication.

### Complete Configurability

From the keyboard and via serial connection, using a guided menu, you can choose the operation mode, the control algorithm, the input and output types, the Set points. You can also insert all parameters.

### **FUZZY Intelligence**

In combination with the PID algorithm and an advanced tuner, this always guarantees a smooth and precise regulation, even for critical processes.

### **High Security**

Guaranteed: by the ISO9000 certificate for planning and construction quality; by the CE brand for security and immunity from disturbances; and by 3 levels of accessibility to parameters.

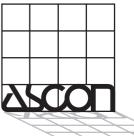
These 96x96 DIN controllerprogrammers are particularly suitable for the control of industrial processes.

P.I.D.









### QD Series - Dual Controller configurable as: 1 loop, cascade, ratio or 2 independent loops QP Series - Controller-Programmer 16 programs 255 segments

### All the performance for precise and safe control

#### The Hardware Package

- Up to 2 inputs for thermocouples, Pt 100, mA, Volt.
- 3 logical inputs for modifying the operating modes: Auto/Man, Local/Remote, keyboard lock, etc...
- Up to 2 control outputs with single or double action: relay or logic, mA or Volt and three point stepping.
- Up to 4 configurable auxiliary relay outputs and 2 logic outputs associated to the program.
- 1 isolated auxiliary output, in mA or Volt, for input, Set point, output or deviation retransmission.
- All types of Set points. The possibility of selecting between Local and Remote, Programmed (QP Series), and of choosing one among the 3 stored Set points.
- RS485 serial communication, with Modbus-Jbus protocol.

#### Complete Configurability.

The possible variants are all always available in the instrument. The operation mode is chosen based on the application. In field operation it is always possible, with the greatest simplicity, to reconfigure the instrument to adapt it to unexpected new requirements. The configuration is effected by keyboard or in serial line. Using a simple, menu-driven tree structure, you can choose, in sequence: control algorithm, input types, ranges, engineering units, output type with security values, Set points, etc ...

#### Fuzzy Intelligence and an advanced "Tuning"

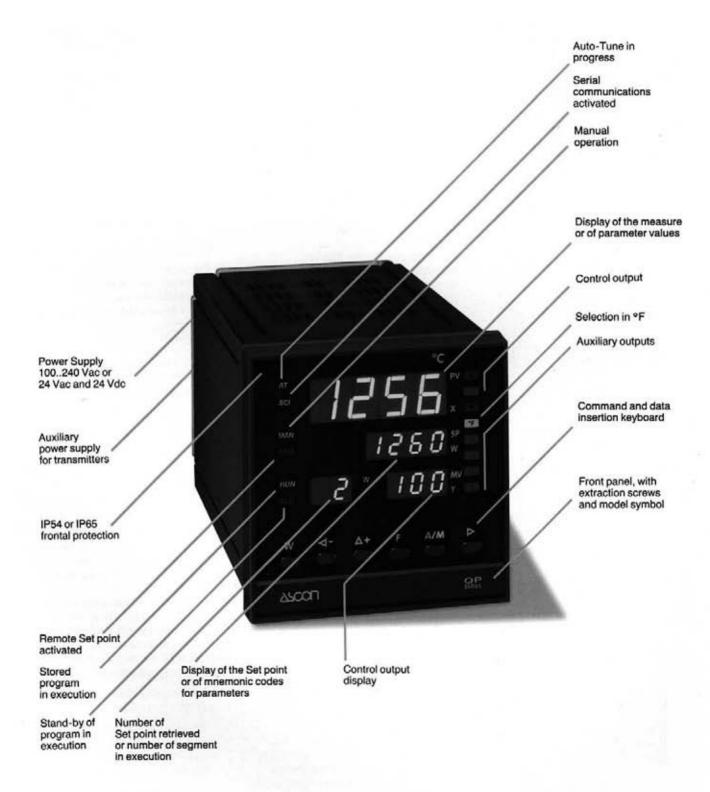
The power and flexibility offered by an advanced PID combined with FUZZY Logic guarantee a precise regulation of the most critical processes, whether in response to the dynamic solicitations or to any variations of the Set point. The tuning of the control parameters is highly facilitated by the use of an intelligent self-tuning algorithm.

#### **Maximum Protection**

All parameters are saved for an unlimited time in non-volatile memory. Their access is protected by password. They are divided into 4 homogeneous groups and are configurable with 3 different levels of operativity: visible and modifiable, visible but not modifiable, invisible. All this gives the instrument more security, but at the same time, more ease for the final operator, without limiting the great flexibility of use.

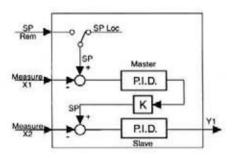
#### **High Security**

Like all ASCON instruments, these are designed in conformance with the most recent EN-IEC security regulations for industrial systems and apparatus, marked with the CE brand, and built in accordance with ISO9002/EN29002 Quality Assurance Management System, guaranteed by CSQ.



### Operation

Fig. 1: Block diagram of Cascade control mode



#### Fig. 2: Block diagram of Ratio control mode

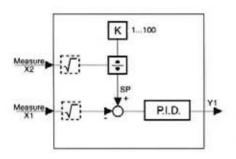


Fig. 3: Outline of Programs selection switch

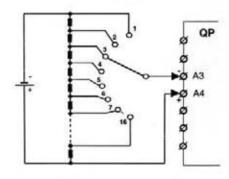
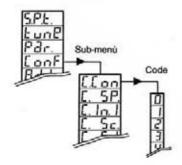


Fig. 4: Tree-structure of Function Menù



#### **OPERATIONAL MODES**

The QD Series process controller includes 2 distinct loops which can be coordinated with each other.

4 selectable operational modes are planned, in configuration as:

1 loop with single or double action, Cascade control loop with single or double action.

Ratio control loop with single or double action,

2 independent loops.

#### Cascade Control (See fig.1)

The primary controller output (Master) becomes the Set point for the secondary controller (Slave). This operational mode is particularly useful in critical processes, where there are long delays, dead times, non linearity, etc.

In fact, the secondary controller anticipates and practically cancels the perturbances acting on the primary process for a more efficient and stable control.

#### Ratio Control (see fig. 2).

A ratio between two variables in the process is maintained at a fixed value. Thanks to the capability of calculating the square root of the input values, it is suitable for combustion control (air/fuel ratio) or for the mixing of 2 fluids.

#### Set point Programmer

QP Series are single loop controllers. offering programmed Set point as an additional option. When operating as Controller-Programmer, a program is built using a simple guided procedure. formed out of the sequence of segments (see fig. 5). For each of these segments, the end point is set along with the time, in addition to the associated logic output status and to the PID parameters chosen between two available sets. The number of loops (finite or infinite) is configurable, as is the execution mode: based on duration priority or on slope priority of the segments. Up to 16 programs can be stored, with a max of 99 segments/program, for a max of up to 255 segments.

You can select, run and suspend the program from the keyboard, from logic inputs or through serial port. A program can also be executed easily using and external voltage divider (see fig. 3).

Display of the progress status (segment being executed, time elapsed, time left, etc.) helps the operator.

#### MENU DRIVEN FUNCTIONS

The man-machine interface is made simple by menus. The tree-structured main menu passes to the submenu and then to the insertion of parameters and configuration codes. Figure 4 shows the menu structure.

#### CONTROL ALGORITHM

The QD and QP Series controllers use an innovative control technique based on **FUZZY** logic, combined with the traditional PID.

"FUZZY" logic uses some concepts from artificial intelligence. At the basis is a set of rules allowing it to act not on the basis of binary statuses (for example, black/white, open/closed, hot/cold), but rather on the evaluation of intermediary statuses (for example, very hot, hot, lukewarm, cold, very cold).

This operation mode is similar to human reasoning, with gradations leading to more real evaluations, and therefore, to more corrective actions. PID-FUZZY control, by ASCON, offers the following substantial advantages:

- reacts rapidly to load and Set point variations, avoiding overshooting;
- allows accurate control of critical processes, even when there are significant changes in the operational conditions (see fig. 6).

The controller calculates the "FUZZY" parameters automatically, deriving them from PID parameters optimized at the time of launching.

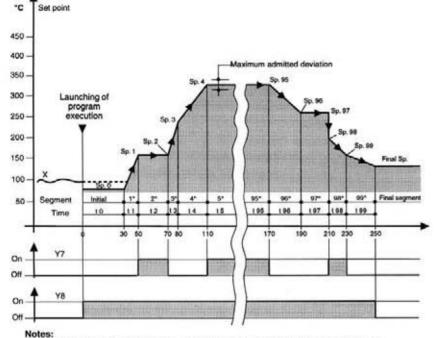


Fig. 5: Example of Programmed Set point with priority slope.

#### Self-tuning "In-Tune"

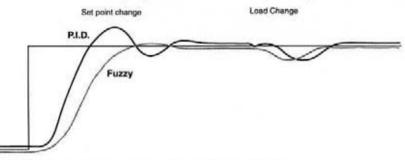
This is a new method for calculating the PID parameters, called that of "natural frequency".

Tuning can occur at a Set point change or during process steady conditions. The method consists in the analysis of the response of the process of solicitations, even very small ones, imposed by the controller for calculating the natural frequency of the process.

The result is a great deal better than that obtainable using conventional methods, such as Ziegler and Nichols or similar ones (see fig. 7).

With duration of initial segment t 0 = 0, execution begins from segment 1 with W = X
 With deviation greater than a maximum admitted value, time count stops in order to guarantee scheduled duration.

Fig. 6: Comparision of step response curves between P.I.D. algorithm and P.I.D.+Fuzzy algorithm in different operating conditions.



Note: P.I.D. parameters have been optimized before the change

#### Fig. 7: " Natural Frequency " tuning ( In Tune )

Response to a load change with a non optimized P.I.D. algorithm	Tuning in progress	Response to a load change with an optimized P.I.D. algorithm	
	ann		
Start of InTune	End of * In Tune *	A = Process Variable (PV B = Output (MV)	

## Technical data

at env. 25°C Total Configurability Operational Modes	type of control, oper insert all control part 1 Loop with single/ 1 Loop as above ar 2 independent loop Cascade (1 master Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	rational mode, inputs ameters. double output d programmed Set ( + 1 slave) e) On-Off, P.I.D., PID "three point steppin D. parameters for ma 0.5999.9% 0.1100 min	<ul> <li>, outputs, Set points</li> <li>point</li> <li>+ FUZZY and PID wing" output</li> </ul>	Only for QP Series Only for QD Series						
Modes	1 Loop with single/ 1 Loop as above an 2 independent loop Cascade (1 master Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	double output ad programmed Set ( + 1 slave) e) On-Off, P.I.D., PID "three point steppin D. parameters for mail 0.5999.9% 0.1100 min	+ FUZZY and PID wi	Only for QD Series						
Modes	1 Loop as above ar 2 independent loop Cascade (1 master Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	d programmed Set ( + 1 slave) e) On-Off, P.I.D., PID "three point steppind D. parameters for mail 0.5999.9% 0.1100 min	+ FUZZY and PID wi	Only for QD Series						
Modes	2 independent loop Cascade (1 master Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	+ 1 slave) e) On-Off, P.I.D., PID "three point steppind D. parameters for mail 0.5999.9% 0.1100 min	+ FUZZY and PID wi	Only for QD Series						
	Cascade (1 master Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	+ 1 slave) e) On-Off, P.I.D., PID "three point steppi D. parameters for ma 0.5999.9% 0.1100 min	ng" output							
Control	Ratio (direct/revers Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	e) On-Off, P.I.D., PID "three point steppi D. parameters for ma 0.5999.9% 0.1100 min	ng" output							
Control	Algorithm Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	On-Off, P.I.D., PID "three point steppi D. parameters for ma 0.5999.9% 0.1100 min	ng" output	ith						
Control	Supplementary P.I. Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	"three point steppin D. parameters for ma 0.5999.9% 0.1100 min	ng" output							
Control	Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	D. parameters for ma 0.5999.9% 0.1100 min		Algorithm "three point stepping" output						
Control	Prop. Band (P) Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	0.5999.9% 0.1100 min	and see the	Supplementary P.I.D. parameters for main loop						
Control	Integral T. (I) Derivative T. (D) Fuzzy Intensity Output Man.Reset	0.1100 min								
Control	Derivative T. (D) Fuzzy Intensity Output Man.Reset	and an advantage of the second s								
Control	Fuzzy Intensity Output Man.Reset	0.0110 min	Excludable with 0.0							
Control	Output Man.Reset	0.090%								
Control	and a second s	0100%	ol							
	Cycle T.	1200 sec.								
	Hysteresis	1200 sec. "Duty Cycle" output 0.0110% For On-Off control								
	Dead Band	0.05%								
	Relative cool									
	gain	0.13								
	Excursion T.	15600 sec	Long Barriel Long							
	Min output resol.	0.110%	g output							
	Potentiometer	0.110% Three point stepping output 100Ω10KΩ								
			50.000 points							
Input X1 (range, see tab. 1)	Common characteristics									
	Accuracy	0.2% ± 1 digit (T/0 0.1% ± 1 digit (m/		Between 100240Vac error is irrelevant						
	Resistance Thermometer	Pt1000 at 0°C (IEC 751) With selection °C / °F /°K	Connection with 2 or 3 wires	Line: 20Ω max (3 wires Thermal drift: < 0.1°C/10°C env. T. < 0.5°C/10Ω line R.						
	Thermocouples	L,J,T,K,R,S,B,N, E,W (IEC 854) with selection °C /°F /°K	Cold joint compensation, internal or external in °C / °F / °K	Line: 150Ω max Thermal drift: < 2μV/°C env. T. < 5μV/10Ω liné R.						
	Continuous	420mA,0-20mA	Engineering units,							
	current	Ri = 30Ω	floating point, with	Input drift:						
	Continuous Voltage	0-20mV, 0-50mV Ri = 10MΩ 0-1/1-5/0-5/0-10V Ri = 10kΩ	or without sq.rt. L.R9999999 H.R9999999 (min 100 digits)	< 0.1%/20°C env. T.						
Input X2	Characteristics iden	tical to input X1 (only	for QD Series)							
~~			Auto/Man switching,	Local/Remote						
Auxiliary inputs	3 logic	Permanent closure of external associated allow:	Set point selection, recall of 3 stored							
	Single of dual with	l direct or reverse actio								
		possible outputs, se								
	Lower limit	090% (Heat)								
	Upper limit	10010% (Heat), -1	0010% (Cool)							
	Max slope									
	Safety value	020% /sec. (Heat 0100%, -10010								
	Forcing value	and a family down a growth place provide the second strength and the second strength of	00% (Heat / Cool), from logic input							
Main	T and a g tailor		Discontinuous Relay, 2 NO contacts, 5A/							
output Y1	Discontinuous	Logic	0-22Vdc, 20mA (for solid state relay)	Galvanically isolated:						
	-	Current	0-20mA, 4-20mA 750Ω/10V max	500 Vac/1min, Protected from s.c.						
	Continuous	Voltage	1-5V, 0-5V, 0-10V 500Ω/20mA max	Res.: 12 bit (0.025%) Accuracy: 0.1%						
		Maria	Dual action relay, 2 NO contacts,							
	"Three Point Stepp	In all	5A/250Vac, 2x10 <sup>5</sup> transitions							

Table 1: Input X1

Input type, s	cale range		
Pt1000 at 0°C	-200600 °C -3281112 °F		
Thermoresistance	-99.9300.0 °C		
J Thermocouple	0600 °C		
Fe-Cu 45% Ni	321112 °F		
L Thermocouple	0600 °C		
Fe-Cu/Ni	321112 °F		
T Thermocouple	-200400 °C		
Cu - CuNi	-328752 °F		
K Thermocouple	01200 °C		
Cromed Alumel	322192 °F		
S Thermocouple	01600 °C		
Pt10% Rh-Pt	322912 °F		
R Thermocouple	01600 °C		
Pt13% Rh-Pt	322912 °F		
B Thermocouple	4001800 °C		
Pt30% Rh-Pt6%Rh	7523272 °F		
N Thermocouple	01200 °C		
Nicrosil-Nisil	322192 °F		
Thermocouple	01100 °C		
Ni-NiMo18%	322012 °F		
W Thermocouple	02000 °C		
W3%Re-W25%Re	323632 °F		
420mA, 020mA			
050mV, 0200mV 01V, 15V, 05V 010V	Configurable eng. units *		

\* Linear or with square root extraction and decimal point selection

#### **Dual** action

For processes with "dual action" output Y1 (for example Heat-cool), two outputs are available with the following possible combinations:

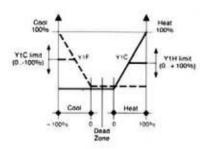
Y1 Heat	R	L	R	C	R	С	L	С
Y1 Cool	R	R	L	R	С	С	С	L

R =Relay; L =Logic; C =Continuous (mA or Volt);

When Y6 continuous output is used for Y1 cool, the retransmission output is not available. 4...20 mA or 0...10 Vdc.

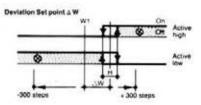
Features at env. 25°C	Description							
	Relay with NC	Cont	acte 5	A/250Vac 2v	105 transitions - Hvet	eresis 0.0110.00%		
	- Islay milling							
Auxiliary	1	High A	Active	-	Deviation Set point	the second s		
outputs Y2-Y3	Action	-	_	Type of	Band Set point	0300 digit		
		ctive	action	Indep. Set point	from HR to LR			
(also available	n Specia				Set point to Y1	0100%		
for loop 2 in								
QD Series)			ons Programmer		d (only for QP Series)			
					abled or disabled with NO or NC contact			
Auxiliary	Came characteristics of V2 V2 (quailable only if continuous V1)							
outputs, Y4-Y5	Same charact	ensuc						
Auxiliary	Galvanic. isolated: 500 Vac/1 min		Current: 0-20mA, 4-20mA 7500/10V max		Input retransmission X1			
analog					Set point retransmission W1			
output Y6	Protected from	from s.c.			Output retransmission Y1 (1st channel △)			
	12 bit (0.025%)	b)	Voltage: 1-5V, 0-5V, 0-10V 50012/20mA max		Output retransmiss	ion Y1 (2nd channel V)		
(option)	Accuracy: 0.1	9/6						
Ingle outputs					Error retransmission (0 to 25% of the range 30 mA max, 28 Vdc (OFF status)			
logic outputs	Open collecto							
QP Series only)	500 Vac isola	tion v	ac max	c/1 min.	Voltage drop: 1Vdd	c max - 30 mA		
	Up or down ra	amp			Local			
	can be set in a		min.		Local and 3 stored			
0		between 0.010% of the range			Remote only			
Set point				0	Local and remote			
	Limits: lower t	lo upp	er can	be	Local and (local +	(etomer		
	sett separatel				terms and a lot and an initial chain from a balant school as how the prior			
	son ooparator	, mu			Programmable (on	and the second sec		
Remote			Curre		Bias in engineering	g units		
Set point	1110122-0020-0020			nA, 4-20mA	-100% + 200%			
(not available	Not isolated		Ri =	300	(compatible with display)			
with	Accuracy 0.19	36	Volta	ae:				
programmed	000000000000000000000000000000000000000			0-5V, 0-10V	Ratio: -9.99+10.	00		
Set point option)				300 kΩ	Local Set point + Remote Set point			
Programmed Set point (option:	From 1 to 999 Time base co Priority of dur	9 repairs nfigur ation o	able in or slop	/ program or seconds, mir e.	nutes, hours.			
	From 1 to 999 Time base co Priority of dur Up to 6 logic of Selection betw Auxiliary volta	9 repe nfigur ation o butput ween 1 age ing	able in or slop s and 3 the 2 a out for	<ul> <li>/ program or seconds, mir</li> <li>a logic inputs, vailable sets or selecting the</li> </ul>	infinite. nutes, hours. programmable and of PID parameters for program remotely.	related to the program. r each segment.		
Set point (option: QP Series only)	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection betw Auxiliary volta Run, hold, wa	9 repe nfigur ation o butput ween h age inp it, etc	atitions able in or slop s and 3 the 2 a out for exec	<ul> <li>/ program or seconds, mir</li> <li>a</li> <li>b logic inputs, vailable sets or selecting the utable from the</li> </ul>	infinite. nutes, hours. programmable and in of PID parameters for program remotely. ne keyboard, logic inp	related to the program. r each segment. buts and via serial port.		
Set point (option:	From 1 to 999 Time base co Priority of dur. Up to 6 logic o Selection betw Auxiliary volta Run, hold, wa With "Natural	9 repe nfigur ation o output ween h age inp it, etc I Freq	able in or slop s and 3 the 2 a out for ., exec uency'	: / program or seconds, mir e. 3 logic inputs, vailable sets of selecting the utable from th ' method. Tur	infinite. programmable and ri of PID parameters for program remotely. he keyboard, logic inp hing can occur at a S	related to the program. r each segment. buts and via serial port. et point change or		
Set point (option: QP Series only)	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection bett Auxiliary volta Run, hold, wa With "Natural during process	9 repe nfigur ation o output ween 1 age inp it, etc I Freq is stea	etitions able in or slop s and 3 the 2 a out for ., exec uency' ady cor	<ul> <li>/ program or seconds, mire.</li> <li>3 logic inputs, vailable sets of selecting the utable from the utable from the ' method. Ture aditions, with</li> </ul>	infinite. nutes, hours. programmable and in of PID parameters for program remotely. ne keyboard, logic inp	related to the program. r each segment. buts and via serial port. et point change or		
Set point (option: QP Series only)	From 1 to 999 Time base co Priority of dur. Up to 6 logic o Selection betw Auxiliary volta Run, hold, wa With "Natural during process Incorporated,	9 repending infigurer ation of output ween in age input in, etc. I Frequencies stea with E	able in or slop s and 3 the 2 a out for ., exec uency' ady cor Bumple	<ul> <li>/ program or seconds, mine.</li> <li>3 logic inputs, vailable sets selecting the utable from th ' method. Tur oditions, with l ses action</li> </ul>	infinite. nutes, hours. of PID parameters for program remotely. te keyboard, logic inp ning can occur at a S launch enabling inde	related to the program. r each segment. buts and via serial port. et point change or		
Set point (option: QP Series only) Auto-tune Auto-Man st.	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection betty Auxiliary volta Run, hold, wa With "Natural during process Incorporated, Switching from	9 repending ation of butput ween to age input age input it, etc I Freques stea with E m keyt	atitions able in or slop s and 3 the 2 a but for ., exec uency' ady cor Bumple board,	<ul> <li>/ program or seconds, mine.</li> <li>3 logic inputs, vailable sets selecting the utable from th ' method. Tur aditions, with logis action logic inputs, or</li> </ul>	infinite. nutes, hours. of PID parameters for program remotely. te keyboard, logic inp ning can occur at a S launch enabling inde or via serial port	related to the program. r each segment. buts and via serial port. et point change or x.		
Set point (option: QP Series only) Auto-tune	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection betty Auxiliary volta Run, hold, wa With "Natural during process Incorporated, Switching from	9 repending ation of output ween h age input it, etc. I Frequent with E m keylous, JI	etitions able in or slop s and 3 the 2 a put for ., exec uency' ady cor Bumple board, bus pro	<ul> <li>/ program or seconds, mine.</li> <li>3 logic inputs, vailable sets selecting the utable from th ' method. Tur aditions, with logis action logic inputs, or</li> </ul>	infinite. nutes, hours. of PID parameters for program remotely. te keyboard, logic inp ning can occur at a S launch enabling inde	related to the program. r each segment. buts and via serial port. et point change or x.		
Set point (option: QP Series only) Auto-tune Auto-Man st. Serial Comms. (option) Auxiliary	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection betw Auxiliary volta Run, hold, wa With "Natural during process Incorporated, Switching from RS 485, Modt (read only or r 24 Vdc ± 109	9 repending of the second seco	etitions able in or slop s and 3 the 2 a but for exec uency' ady con Bumple board, bus pro- rrite) mA ma	<pre>/ program or seconds, mire. 3 logic inputs, vailable sets, selecting the utable from th ' method. Tur iditions, with i ses action logic inputs, o blocol, 1200, i ax</pre>	infinite. programmable and i of PID parameters for program remotely. te keyboard, logic ing ning can occur at a S launch enabling inde or via serial port 2400, 4800, 9600 bit/	related to the program. r each segment. buts and via serial port. et point change or x.		
Set point (option: QP Series only) Auto-tune Auto-Man st. Serial Comms. (option)	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection betw Auxiliary volta Run, hold, wa With "Natural during process Incorporated, Switching from RS 485, Modt (read only or r 24 Vdc ± 109	9 repending ation of output ween to age input is stea with E m keylous, Jl ead/w %, 50 hal trans	etitions able in or slop s and 3 the 2 a but for exec uency' ady con Bumple board, bus pro- rrite) mA ma msmitte	<pre>/ program or seconds, mir e. 3 logic inputs, wailable sets selecting the utable from th ' method. Tur iditions, with i ess action logic inputs, o btocol, 1200, 2 x ers (2, 3, 4 wir</pre>	infinite. programmable and i of PID parameters for program remotely. ne keyboard, logic inp ning can occur at a S aunch enabling inde pr via serial port 2400, 4800, 9600 bit/ e connections)	related to the program. r each segment. outs and via serial port. et point change or x. sec., 2 wires,		
Set point (option: QP Series only) Auto-tune Auto-Man st. Serial Comms. (option) Auxiliary	From 1 to 999 Time base co Priority of dur. Up to 6 logic of Selection bett Auxiliary volta Run, hold, wa With "Natural during process Incorporated, Switching fror RS 485, Modt (read only or r 24 Vdc ± 109 Up to 2 extern	9 repending ation of output ween to age input is stea with E m keylous, Jl ead/w %, 50 hal trans	etitions able in or slop s and 3 the 2 a but for exec uency' ady cor Bumple board, bus pro- vrite) mA man smitte Out o	<pre>/ program or seconds, mir e. 3 logic inputs, wailable sets selecting the utable from th ' method. Tur ditions, with I ass action logic inputs, o blocol, 1200, 2 ux ers (2, 3, 4 wir range or har</pre>	infinite. programmable and i of PID parameters for program remotely. the keyboard, logic implication pring can occur at a S launch enabling inder privia serial port 2400, 4800, 9600 bit/ e connections) dware failure (short of	related to the program. r each segment. outs and via serial port. et point change or x. sec., 2 wires,		
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Fig. 8: Output characteristic for dual action controllers. Example: Heat - Cool

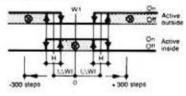


Y1C = Cool output (----) Y1H = Heat output (-----) Indication for Y1: -100%...+ 100%

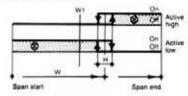
Fig. 9: Auxiliary control outputs Y2 and Y3





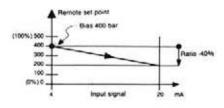


Independent Set point W

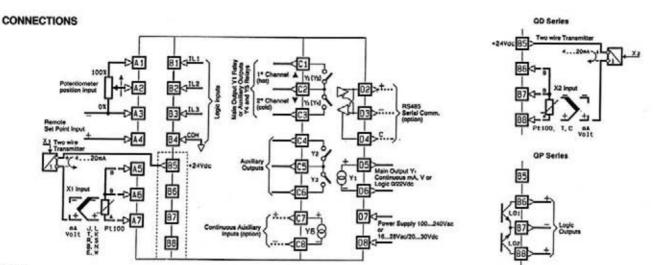


Note: W1: Main Set point H : Auxiliary outputs hysteresis

Fig. 10: Example of Bias and Ratio setting for a Controller with scale range 0...500 bar

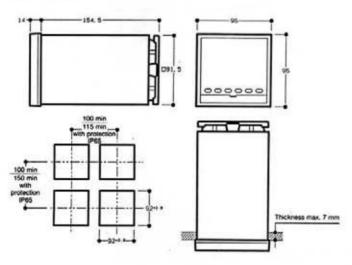


### Connections and fitting dimensions

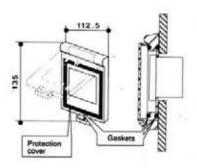


Notes:
1 To supply a 3 or 4 wire transmitter, use terminals B5 (+) and A6 (-) or B5 (+) and B7 (-)
2 Main control output Y1 can be selected within the 5 built-in possible functions: relay (terminals C1 and C2), logic or continuous 4...20 mA or 0...10 Volt (terminals D5 and D6) and three point stepping (terminals C1, C2 and C3).

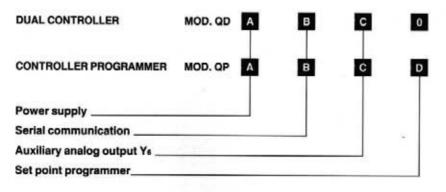
#### **OVERALL DIMENSIONS**



#### FRONT PROTECTION KIT IP65: mod. F10-435-2A101



## **Ordering Codes**



Power supply	A
100240 Vac 50/60 Hz	3
1628 Vac 50/60 Hz and 2030 Vdc	5
Serial Communication (option)	в
None	0
RS485, Modbus, Jbus	3
Auxiliary analog output Ys (option)	C
None	0
0/420mA, 0/15V, 010V)	1
Set point programmer (option QP only)	D
None	0
Up to 16 programs, 255 segments	1