

10 Steps to change

a controller **362-D or 361-D**  a controller **362MC**
against

Guided from the operation manual, inside you will find the basic display and operation functions of the 362MC, you can change easily an old controller against a new one step by step as follows:

1st Step

Please check the type of the installed old controller and the type of the delivered new controller via the material no. (M.-Nr./Art.-Nr.) at the type plate on the backside of the controller. Verify the equivalence of the types against the **substitution table** at Page E2.

2nd Step

Please change the connection from the old controller to the new controller, wire by wire according the equivalent **connection table A, B, C or D** at Page E3, E4, E5 or E6. Check the wiring, switch on the supply voltage and set the controller to Manual mode by pressing **Man** and **Exit** buttons simultaneously.

3rd Step

Please select the equivalent profile according the **substitution table** at Page E2 and save to an available profile memory for this installation via the **Save as** function.

4th Step

Please change one additional parameter, if necessary according the **substitution table** at Page E2.

5th Step

Please check the actuator for correct operation in Manual mode, check the correct acquisition of the measured values and calibrate the resistance input with the **R scale** parameter function, if necessary.

6th Step

Please check the potentiometer adjustments of the old controller, translate the adjustments via the equivalent **adjustment table** at Page E7 to usual 362MC adjustments and change the parameter, if necessary.

7th Step

Please adjust the setpoint.

8th Step

Please switch the controller to Automatic mode (**Auto** button) and start up the controlled system.

9th Step

Please check the controlled system in Automatic mode and adjust some of the parameters, if appropriate, as described on Page E8.

10th Step

At the end of the commissioning procedure, please record the parameter changes.

Substitution table

4th Step: Change in addition this parameter

3rd Step: Start the commissioning with Profile-No.

2nd Step: Install with connection table

1st Step: Change the controller

the old controller		to	the new controller		Table	without Trend see Note 1)	with Trend see Note 2)	in menue	with name	to value	Note
Typ	M.-Nr.		Typ	Art.-Nr.							
361-D	9343616000	↔	362MC	9362000100	C	6					
361-D	9343616100	↔	362MC	9362000500	C	7					
361-D	9343616200	↔	362MC	9362000150	C	6		Input	Scale-F	500.0	
361-D	9343616300	↔	362MC	9362000500	C	7					3)
361-D	9343616400	↔	362MC	9362000100	C	6		Output	OutputY	1Lin 0>	
362-D	9343626000	↔	362MC	9362000000	A	1	3				
362-D	9343626050	↔	362MC	9362001000	A	1	3				
362-D	9343626100	↔	362MC	9362000400	A	5					
362-D	9343626150	↔	362MC	9362001400	A	5					
362-D	9343626200	↔	362MC	9362000050	A	8	9				
362-D	9343626250	↔	362MC	9362001050	A	8	9				
362-D	9343626300	↔	362MC	9362000400	A	5					3)
362-D	9343626350	↔	362MC	9362001400	A	5					3)
362-DS	9343626400	↔	362MC	9362000800	B	10	11				6)
362-DS	9343626450	↔	362MC	9362001800	B	10	11				6)
362-D	9343626500	↔	362MC	9362000000	A	1	3				
362-D	9343626550	↔	362MC	9362001000	A	1	3				
366-D	9343666000	↔	362MC	9362000000	A	1	3				4)
366-D	9343666050	↔	362MC	9362001000	A	1	3				4)
366-D	9343666200	↔	362MC	9362000050	A	8	9				4)
366-D	9343666250	↔	362MC	9362001050	A	8	9				4)
366-V	9343661000	↔	362MC	9362010000	D	4					5)

Note 1) Profile for regulation without trendcompensation (only with 1st PT100)

Note 2) Profile for regulation with trendcompensation (with 1st and 2nd PT100)

Note 3) The analogue input of the 362MC is 4-20mA instead of 0-20mA ! You have to change the transmitter too !

Note 4) The function of the 366-D is integrated in each controller 362MC. Please replace both, the setpoint-unit 366-D and the old controller 362-D (or 361-D), against the controller 362MC.

Note 5) The function of the 366-V is integrated in the controller 362MC with additional function **Disturbance feedforward control**. Please replace both, the setpoint adjusting unit 366-V and the old controller 362-D against the controller 362MC.

Note 6) Attention: The replacement instruction described here is not valid for 362-DS controllers that are installed in combination with a PLC.

Connection table: **A**

362MC Software version: Standard

362MC Hardware version: Standard or special version

Terminal 362-D	Terminal 362MC	Signal name at 362MC	Description and Comments
1	1	L1	Voltage supply connection 230V-AC or 115V-AC
2	2	N	
3	4	N	Output, 1st relay set + relay plus - relay minus
4	5	+ (Open)	
5	6	- (Closed)	
6	10	Common	Alarm relay (Closed at alarm)
7	11	Make contact	
8	3	SL	Protective earth conductor or cabinet earth
9	16	E3	Binary input E3, relay plus continuous OFF
10	20	E•	Binary inputs, common
11	14	E1	Binary input E1, relay minus continuous OFF
12	20	E•	Binary inputs, common
13	20	E•	Binary inputs, common
14	17	E4	Binary input E4, relay plus continuous ON
15	15	E2	Binary input E2, relay minus continuous ON
16	20	E•	Binary inputs, common
17	29		Analogue input 4 (resistance) Connection for resistor feedback sensor 0..200 Ω
18	30		
19	34 35 33	(PT100-2)	Analogue input 2 (PT100)
20			Connection for 2 nd temperature sensor
			Make a direct connection between 33-34 at the 362MC !
21	nc		(Free terminal, not connected)
22	36		Analogue input 1 (PT100) or Connection for 1 st temperature sensor or current transmitter Analogue input 1 (4-20mA in special version)
23	37	- (I)	
24	38	+	
25	nc		
			Insulate wire, do not connect !
26	(23)	Module 2b	362-D actual value output X At 362MC only supported in a special version ①
27	(24)	Module 2a	
28	nc	only 362-D	362-D connection to setpoint units At 362MC this function is integrated Remove wire, do not connect ! (See Terminal 366-D)
29	nc	only 362-D	
30	nc	only 362-D	
31	nc	only 362-D	
32	nc	only 362-D	Not used, do not connect !
Terminal 366-D			
1 up to 6	nc		Insulate wire, do not connect !
7 up to 9	nc		Remove wire, do not connect !
12	19	E6	Binary input E6, Switchover to 2nd Setpoint
13	20	E•	Binary inputs, common (2 nd Setpoint adjustable in 362MC)
21 up to 23	nc		Remove wire, do not connect !

If you need a function, that is marked with ① please contact us to find a solution.

Connection table: **B**

362MC Software version: Standard

362MC Hardware version: Special **Analogue input 3 (0-10V)**

Terminal 362-DS	Terminal 362MC	Signal name at 362MC	Description and Comments
1	1	L1	Voltage supply connection 230V-AC or 115V-AC
2	2	N	
3	4	N	Output, 1st relay set + relay plus - relay minus
4	5	+ (Open)	
5	6	- (Closed)	
6	10	Common	Alarm relay (Closed at alarm)
7	11	Make contact	
8	3	SL	Protective earth conductor or cabinet earth
9	16	E3	Binary input E3, relay plus continuous OFF
10	20	E•	Binary inputs, common
11	14	E1	Binary input E1, relay minus continuous OFF
12	20	E•	Binary inputs, common
13	20	E•	Binary inputs, common
14	17	E4	Binary input E4, relay plus continuous ON
15	15	E2	Binary input E2, relay minus continuous ON
16	20	E•	Binary inputs, common
17	29		362-DS external setpoint display input (remove wire !) At 362MC select this function via parameter in menu display
18	30		
19	34		Analogue input 2 (PT100) Connection for 2nd temperature sensor Make a direct connection between 33-34 at the 362MC !
20	35	(PT100-2)	
	33		
21	nc		(Free terminal, not connected)
22	36		Analogue input 1 (PT100) or Connection for 1 st temperature sensor or current transmitter Analogue input 1 (4-20mA in special version) Insulate wire, do not connect !
23	37	- (I) (PT100-1)	
24	38	+	
25	nc		
26	(23)	Module 2b	362-DS actual value output X At 362MC only supported in a special version ①
27	(24)	Module 2a	
28	32	+ (U)	Analogue input 3 external setpoint voltage input
29	nc	only 362-DS	(362-DS setpoint output) Remove wire, do not connect !
30	31	0 (U)	Common for voltage transmitter (0-10V for 0-200°C)
31	nc	only 362-DS	362-DS internal voltage ±12V At 362MC not supported
32	nc	only 362-DS	Please use an external powersupply for the transmitter!

External Installation

19	E6	Binary input E6, Switchover to 2nd Setpoint
20	E•	Binary inputs, common (2 nd Setpoint adjustable in 362MC)


If you need a function, that is marked with ① please contact us to find a solution.

Connection table: C

362MC Software version: Standard

362MC Hardware version: Standard or special version and
with hardware extension **analog outputs**



Terminal 361-D	Terminal 362MC	Signal name at 362MC	Description and Comments
1	1	L1	Voltage supply connection 230V-AC or 115V-AC
2	2	N	
3	10	Common	Alarm relay (Closed at alarm)
4	11	Make contact	
5	12	Break contact	
6	3	SL	Protective earth conductor or cabinet earth
7	22	c -	Analogue output 1 0(4)-20mA, ±20mA (hardware extension) (in special version 0-10 V, ±10 V)
8	21	d +	
9	nc		(Free terminal, not connected)
10	nc		
11	nc		
12	(17)	(E4)	361-D output control E+, E- At 362MC only in a special version served
13	(15)	(E2)	
14	nc		361-D output control 12mA At 362MC not supported
15	nc		
16	nc		(Free terminal, not connected)
17	nc		
18	18	E5	Binary input E5, Switchover to 2nd Parameter set
19	20	E•	Binary inputs, common (Set without I adjustable in 362MC)
20	nc		361-D output control reversed direction (remove wire) At 362MC select this function via parameter in menu output
21	nc		
22	36		Analogue input 1 (PT100) or Connection for 1 st temperature sensor or current transmitter Analogue input 1 (4-20mA in special version)
23	37	- (I)	
24	38	+	
25	nc		
			Insulate wire, do not connect !
26	(23)	Module 2b	361-D actual value output X At 362MC only supported in a special version
27	(24)	Module 2a	
28	nc	only 361-D	361-D connection to setpoint units Not used, do not connect !
29	nc	only 361-D	
30	nc	only 361-D	
31	(17)	(E•)	361-D common for output controls
32	(16)	(E•)	Binary inputs, common (At 362MC only in a special version)

If you need a function, that is marked with  please contact us to find a solution.

Connection table: **D**

362MC Software version: Standard with additional function
disturbance feedforward control

362MC Hardware version: Standard or special version

Terminal 362-D	Terminal 362MC	Signal name at 362MC	Description and Comments
1	1	L1	Voltage supply connection 230V-AC or 115V-AC
2	2	N	
3	4	N	Output, 1st relay set + relay plus - relay minus
4	5	+ (Open)	
5	6	- (Closed)	
6	10	Common	Alarm relay (Closed at alarm)
7	11	Make contact	
8	3	SL	Protective earth conductor or cabinet earth
9	16	E3	Binary input E3, relay plus continuous OFF
10	20	E•	Binary inputs, common
11	14	E1	Binary input E1, relay minus continuous OFF
12	20	E•	Binary inputs, common
13	20	E•	Binary inputs, common
14	17	E4	Binary input E4, relay plus continuous ON
15	15	E2	Binary input E2, relay minus continuous ON
16	20	E•	Binary inputs, common
17	29		Analogue input 4 (resistance)
18	30		Connection for resistor feedback sensor 0..200 Ω
19	nc		362-D 2nd temperature sensor
20	nc		Not used in this configuration
21	nc		(Free terminal, not connected)
22	36	(PT100-1)	Analogue input 1 (PT100)
23	37		Connection for 1 st temperature sensor
24	38		(Outlet temperature)
25	nc		Insulate wire, do not connect !
26	(23)	Module 2b	362-D actual value output X At 362MC only supported in a special version 
27	(24)	Module 2a	
28	nc	only 362-D	362-D connection to setpoint adjusting units At 362MC this function is integrated (additional function)
29	nc	only 362-D	
30	nc	only 362-D	
31	nc	only 362-D	Remove wire, do not connect ! (See Terminal 366-V)
32	nc	only 362-D	Not used, do not connect !
32	nc	only 362-D	Not used, do not connect !
Terminal 366-V			
1 up to 6	nc		Insulate wire, do not connect !
7	32	+ (I)	Analogue input 3 (for current transmitter) (I-ADJ measured value for engine output)
8	31	-	
9 up to 11	nc		Remove wire, do not connect !
14	33	(PT100-2)	Analogue input 2 (PT100)
15	34		Connection for 2 nd temperature sensor
16	35		(inlet temperature)
17	nc		Insulate wire, do not connect !
18	(23)	Module 2b	362-V actual value output X (not used) At 362MC only supported in a special version 
19	(24)	Module 2a	

Adjustment table (6th Step)

The most usual potentiometer adjustments of the controller 362-D or 361-D can be translated to the 362MC parameter values via the following tables.

Change a 362-D controller			
362-D		362MC	
Potentiometer	Scale	Parameter	Value
Xp	9	Kr	3.5
Xp	7	Kr	12.0
Xp	5	Kr	20.0
Xp	3	Kr	30.0
Tn	7	Tn	300s
Tn	5	Tn	180s
Tn	2	Tn	60s
E _A	5	Deadbd	0.5%
E _A	10	Deadbd	1.0%
S ₂	1	Tv	12.0s
		Vd	0.5
S ₂	2	Tv	25.0s
		Vd	0.5

Change a 361-D controller			
361-D		362MC	
Potentiometer	Scale	Parameter	Value
Xp	9	Kr	8.0
Xp	7	Kr	13.0
Xp	5	Kr	22.0
Xp	3	Kr	31.0
Tn	7	Tn	150s
Tn	5	Tn	100s
Tn	3	Tn	70s
Tv	1	Tv	8.0s
		Vd	3.0
Tv	2	Tv	18.0s
		Vd	3.5

Note:

The S₂-adjustment is only used in regulations with trendcompensation (with 1st and 2nd PT100)

Documentation table (10th Step)

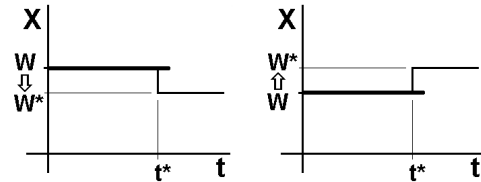
In the following table you can record the potentiometer adjustments of the old controller type 362-D or 361-D and the parameter changes of the new 362MC controller after commissioning.

old controller			new controller	
Potentiometer	Scale 362-D	Scale 361-D	Parameter	Value 362MC
Xp			Kr	
Tn			Tn	
E _A			Deadbd	
S ₂			Tv	
Tv			Vd	

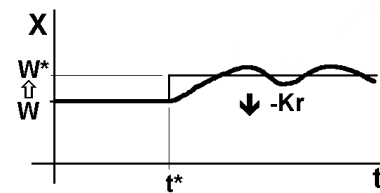
Adjusting the main parameters, if necessary. (9th Step)

In most applications only minor adaptations of the factory set-up is necessary. The most important adaptations concern the controller parameters **Kr** and **Tn**. The aim is to make the controlled system stable and reduce control deviations as fast as required and possible. We recommend the following steps, starting with the factory set-up:

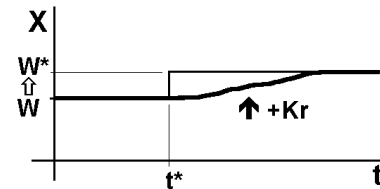
- 1 To test the behaviour of the controlled system it should be stimulated using a small change of the setpoint **W** to **W*** (up or down).
Go on with →2 or →3.



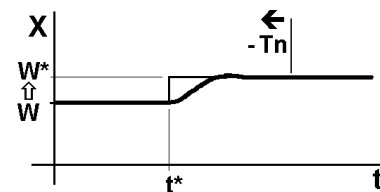
- 2 If the controlled system is not stable (swinging), decrease P-gain **Kr** by steps and loop with step →1 and →2 until the system is stable and shows only a little or no overshoot.
After that go on with →4.



- 3 If the controlled system is already stable (no swinging), increase P-gain **Kr** by steps and loop with step →1 and →3 until the system shows a little or no overshoot and is still stable too.
After that go on with →4.



- 4 If the control deviation decreases to slowly in the stable system, decrease reset time **Tn** by steps and loop with step →1 and →4 until the system so fast as required and possible.
Pay attention to the **stability of the system** and if required, go on again with →2.



Service contact

In case of problems, please contact us via phone, fax or e-mail and give us by this way the following basic informations:

M.-Nr. (material-no.) of the old 36x-D controller (from the type plate on the backside)	
Art.-Nr. (article-no.) of the new 362MC controller (from the type plate on the backside)	
362MC software type and version no. (always displayed on power up of the 362MC)	