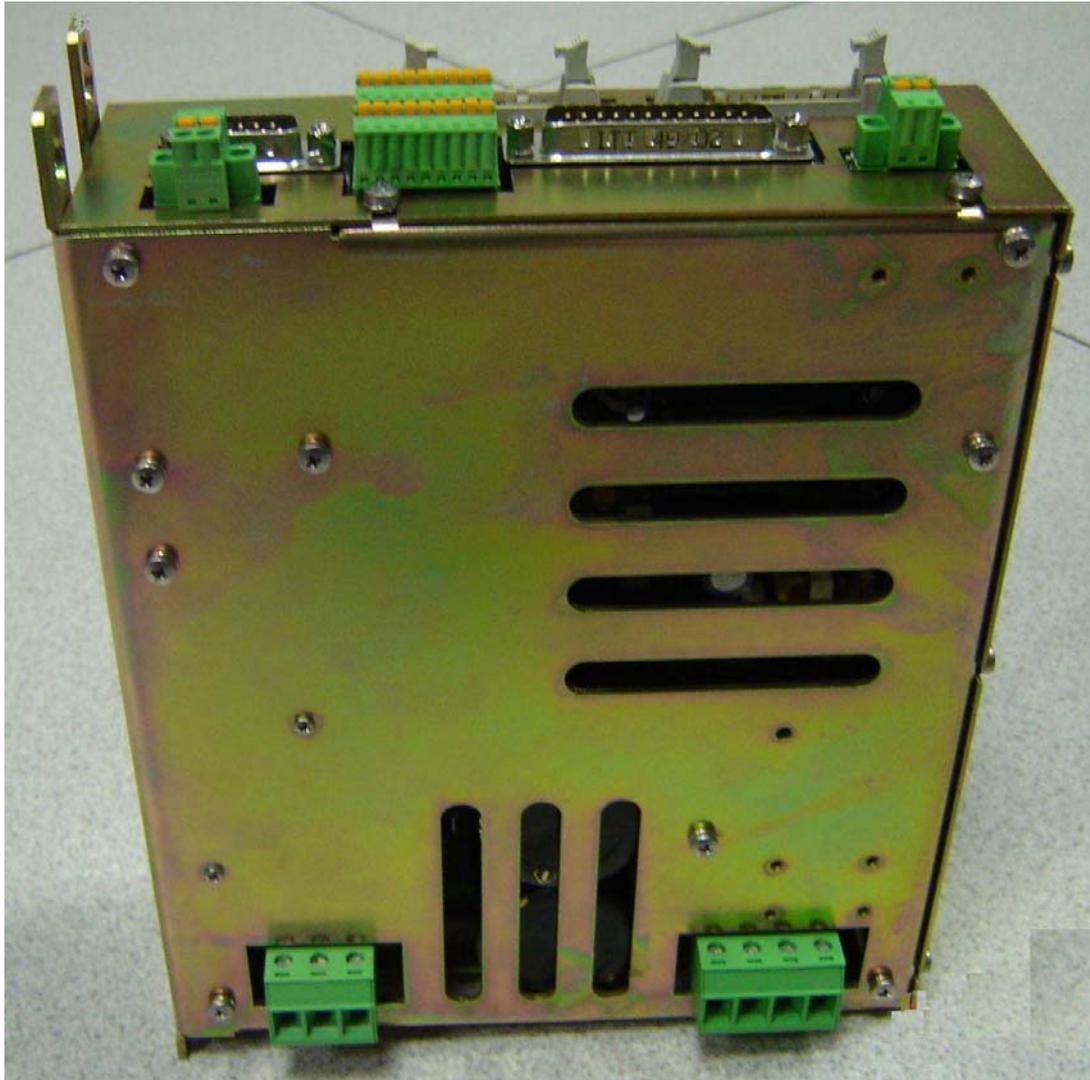




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INTRODUCTION TO NEW DDC4 CONTROL UNIT FOR SM* TURRETS.





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BRIEF DESCRIPTION OF DDC4, THE NEW CONTROL UNIT FOR SM* TURRETS.

DRIVER/TURRET INTERFACE

1. POWER SUPPLY.
 - 400V 3AC 50/60Hz (400V type).
 - 230V 3 AC 50/60Hz (230V type).

 - 24VDC auxiliary (1A max, ½ A stand-by) (galvanic insulated).
 - Power bridge galvanic insulated from control side.
2. Turret interface.
 - 5 digital inputs 24 DC with supply from DDC4 (PTC protected)
 - resolver interface, (supply protected).
 - Second transducer interface (for future applications)
3. Diagnosis/service interface
 - RS232 galvanic insulated with dedicated software.
 - FW update available using RS232 port.
 - CAN galvanic insulated (for future applications).

CNC interface.

1. Supply
 - 24VDC (4A max)
2. Interface CNC/field
 - 16 digital Inputs 24VDC
 - 12 digital outputs 24VDC 100 mA (PTC protection)
 - 2 digital outputs 24VDC 2A (PTC protection)
 - 1 analog input 0-10V (for future applications).
 - galvanic insulated from control side.

Mechanical interface.

- Same fixing point as DDC1 and DDC2.
- Reduced overall dimension thanks to the transformer removal.

ELECTRICAL INTERFACE: (See drawings).

- Three-Phase AC Input: 3 poles PHOENIX POWER COMBICON 7,62 mm
- Servomotor AC power output: 4 poles PHOENIX POWER COMBICON 7,62 mm
- Turret signal interface: 25 poles SUB-D.
- Turret signal interface DDC1 and DDC2 compatible: 18 poles spring connector for switches, 8 poles HE14 for motor resolver.
- 24 V DC supply: two PHOENIX MINI COMBICON 3,5 mm.
- Digital INPUT: 16 poles IDC connector (flat cable).
- Digital OUTPUT: 20 poles IDC connector (flat cable).



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Technical features:

Full Digital DSP-based Control:

- Field oriented control to improve efficiency and reduce EMC noise.
- Reduced component number to improve reliability.
- Possible improvement by changing the software management of the turret cycle.

Use of Intelligent Power Modules:

- Better efficiency
- Integrated protection against overload, over-temperature, short circuit, lack of supply.
- Compact design.
- EMC reduced.
- No more external reactor.

Number of I/O

- Possible extension of functioning modes.
- Extended configuration range.
- Extended diagnosis.
- Position feedback ready.

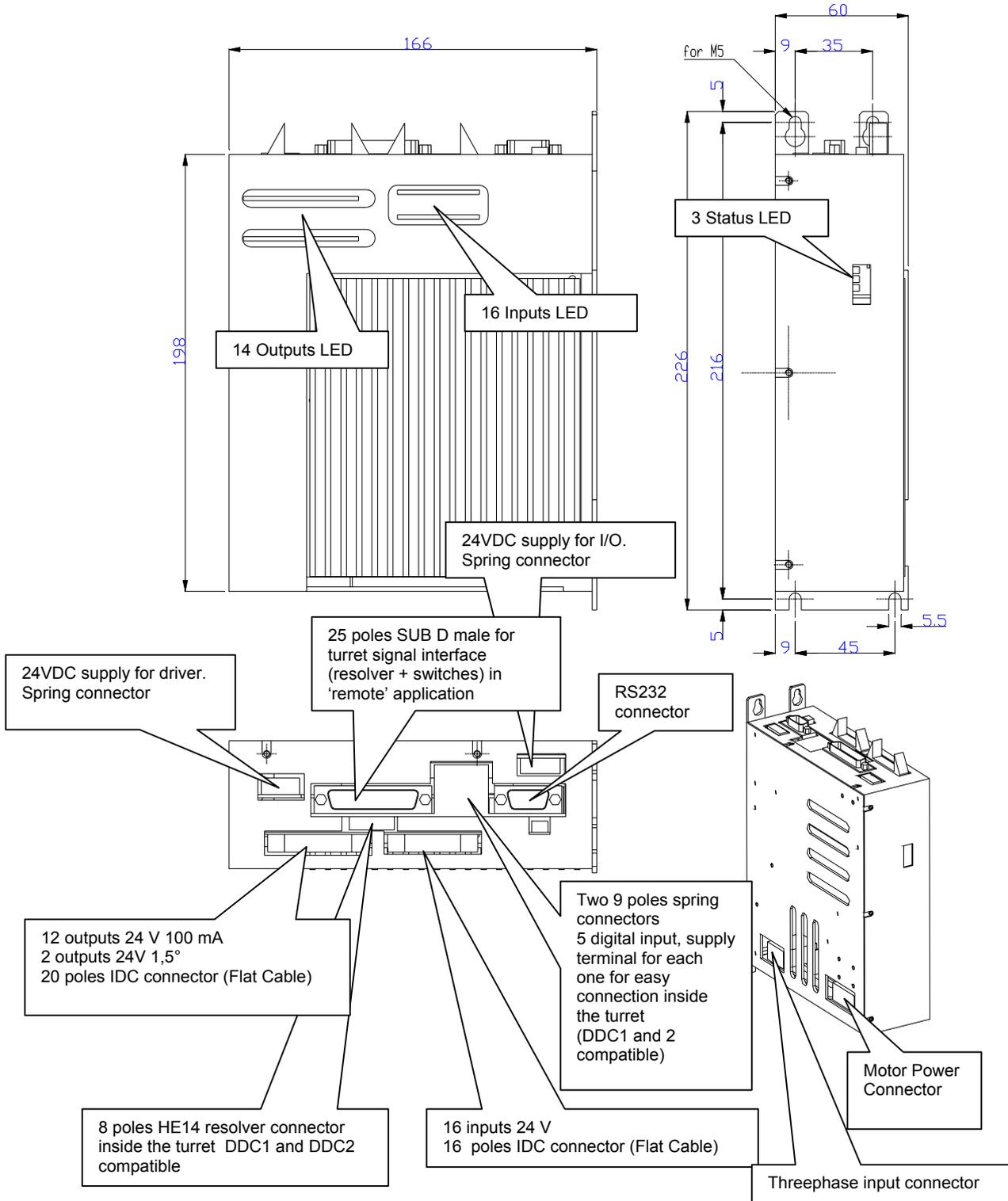
Diagnosis.

- Extended number of LED's to give immediate information about failures.
- Battery backup to store more information for troubleshooting.
- Temperature control of heatsink.
- Environment temperature control.



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Overall dimensions and connector description:





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Comparison to existent DDC1 and 2 controller

Differences between DDC4 and DDC1 and 2 connections 'remote' type

Same mechanical footprint.

Terminal	DDC* 'remote'	DDC4	HOW TO
Three-phase supply	FASTON E1,E2,E3	PHOENIX PC4 screw connector CN10	Replace FASTON with Ferules
Auxiliary 230V supply	FASTON E9,E10	No more required	Do not provide wires
Power Motor Supply	FASTON E6,E7,E8	PHOENIX PC4 screw connector CN11	Replace FASTON with Ferules
24 VDC supply	HE14 terminal	Two Phoenix MC spring connectors CN3,CN8	The wire change place
Digital inputs from CNC	HE14 terminal P4	IDC (flat cable) connector 16 poles CN2	Different cable required
Digital outputs to CNC	HE14 terminal P3	IDC (flat cable) connector 20 poles CN1	Different cable required
Digital outputs to valves	HE14 terminal P3 (low current)	IDC (flat cable) connector 20 poles CN1 (through high current MOS 4 wires each output)	Different cable required
Digital inputs from turret	Spring terminal P5	Spring connector CN5a or SUB-D 25 connector CN7	No modifications
Motor Resolver + thermal detector	HE14 P6	HE14 CN6 or SUB-D 25 connector CN7	No modifications
AC reactor	required	No more required	Remove AC reactor
fuses F5,F8	required	No more required	Can be removed
Fuses F6,F7	Required for output protection	required for cable protection	Keep them
SIGNAL Ground (TE)	FASTON	FASTON	
Ground (PE)	FASTON	FASTON	

Differences between DDC4 and DDC1 and 2 connections 'rack' type

Mechanical footprint different.

Terminal	DDC* 'rack'	DDC4	HOW TO
Three-phase supply	PHOENIX PC4 screw connector X6	PHOENIX PC4 screw connector CN10	Same type
Auxiliary 230V supply	No more required	No more required	Do not provide wires
Power Motor Supply	PHOENIX PC4 screw connector X7	PHOENIX PC4 screw connector CN11	Same type
24 VDC supply	SUB-D 25 X1 connector	Two Phoenix MC spring connectors	Different cable required
Digital inputs from CNC	SUB-D 25 X1 connector	IDC (flat cable) connector 16 poles CN2	Different cable required
Digital outputs to CNC	SUB-D 25 X1 connector	IDC (flat cable) connector 20 poles CN1	Different cable required
Digital outputs to valves	SUB-D 25 X1 connector (through internal relays)	IDC (flat cable) connector 20 poles CN1 (through high current MOS 4 wires each output)	Different cable required
Digital inputs from turret	SUB-D 15 X4 connector	Spring connector P5a or SUB-D 25 connector CN7	Different cable required
Motor Resolver + thermal detector	SUB-D 15 X4 or SUB-D 9 X3	HE14 P6 or SUB-D 25 connector CN7	Different cable required
AC reactor	Internal	No more required	
F5,F8	Internal	No more required	
F6,F7	Internal	required for cable protection	Keep them
SIGNAL Ground (TE)		FASTON	Change Ferules to FASTON
Ground (PE)	PHOENIX PC4 screw connector	FASTON	Change Ferules to FASTON



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Differences between CONNECTION BOX for DDC4 and CONNECTION BOX FOR DDC1 and DDC2 when the controller is inside the turret.

Terminal	Connection Box DDC1 and 2'	Connection Box DDC4	HOW TO
Three-phase supply	FASTON E1,E2,E3	FASTON E1,E2,E3	No modifications
Auxiliary 230V supply	FASTON E5,E6	No more required	Do not provide wires
24 VDC supply for I/O	WAGO spring terminal CM1	Phoenix spring terminal	The wire change place but same numbering
24 VDC supply for Valves	WAGO spring terminal CM2	Uses the same supply for I/O	
24 VDC supply for driver	Not foreseen	Phoenix spring terminal	The wire change place but same numbering Use the old CM2 wire
Digital inputs from CNC	WAGO spring terminal	Phoenix spring terminal	No modifications
Digital outputs to CNC	WAGO spring terminal	Phoenix spring terminal	No modifications
Digital outputs to valves	WAGO spring terminal	Phoenix spring terminal	No modifications
Serial connector	DB9 male	DB9 male + Phoenix spring terminal	No modifications, it is possible to use spring terminals to 'remote' the serial connection into the cabinet
Fuses F1,F2	Required for output protection against wiring errors during start-up	No more required due increased separation of supply, input,output and due to the PTC protection of each output.	Not provided in connection box
Jumper LK1,LK2,LK3	Selection for inertia and position	The same, also present on spring terminal	No modifications
Ground PE	FASTON E4	FASTON E4	



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Spare parts management:

Spare parts for DDC1 and DDC2 will be available for long time.

By the way it is foreseen to use DDC4 also for spare parts in this way.

By using the connection kit adapter 0496317 (to be ordered separately) it is possible to have a fully compatibility to the DDC1 and DDC2

Same mechanical footprint.

Terminal	DDC* 'remote'	DDC4+ADAPTER 0496317	HOW TO
Three-phase supply	FASTON E1,E2,E3	PHOENIX PC4 screw connector CN10	Replace FASTON with Ferules
Auxiliary 230V supply	FASTON E9,E10	No more required	Do not provide wires
Power Motor Supply	FASTON E6,E7,E8	PHOENIX PC4 screw connector CN11	Replace FASTON with Ferules
24 VDC supply	HE14 terminal	HE14 terminal	No modifications
Digital inputs from CNC	HE14 terminal P4	HE14 terminal P4	No modifications
Digital outputs to CNC	HE14 terminal P3	HE14 terminal P3	No modifications
Digital outputs to valves	HE14 terminal P3 (low current)	HE14 terminal P3	No modifications
Digital inputs from turret	Spring terminal P5	HE14 terminal P3 (low current)	No modifications
Motor Resolver + thermal detector	HE14 P6	HE14 P6	No modifications
AC reactor	required	No more required	Remove AC reactor
fuses F5,F8	required	No more required	Can be removed
Fuses F6,F7	Required for output protection	required for cable protection	Keep them
SIGNAL Ground (TE)	FASTON	FASTON	
Ground (PE)	FASTON	FASTON	

By using the connection kit adapter 0496317 (to be ordered separately) and fitting into a 'rack' box it is possible to have a fully compatibility to the DDC1 and DDC2

Terminal	DDC* 'rack'	DDC4 inside 'RACK' box *	HOW TO
Three-phase supply	PHOENIX PC4 screw connector X6	PHOENIX PC4 screw connector	Same type
Auxiliary 230V supply	No more required	No more required	Do not provide wires
Power Motor Supply	PHOENIX PC4 screw connector X7	PHOENIX PC4 screw connector CN11	Same type
24 VDC supply	SUB-D 25 X1 connector	SUB-D 25 X1 connector	Same cable
Digital inputs from CNC	SUB-D 25 X1 connector	SUB-D 25 X1 connector	Same Cable
Digital outputs to CNC	SUB-D 25 X1 connector	SUB-D 25 X1 connector	Same Cable
Digital outputs to valves	SUB-D 25 X1 connector (through internal relays)	SUB-D 25 X1 connector (through internal high current MOS)	Same Cable
Digital inputs from turret	SUB-D 15 X4 connector	SUB-D 15 X4 connector	Same Cable
Motor Resolver + thermal detector	SUB-D 15 X4 or SUB-D 9 X3	SUB-D 15 X4 or SUB-D 9 X3	Same Cable
AC reactor	Internal	No more required	
F5,F8	Internal	No more required	
F6,F7	Internal	required for cable protection	Keep them
SIGNAL Ground (TE)		internal	Same type
Ground (PE)	PHOENIX PC4 screw connector	PHOENIX PC4 screw connector	Same Type

NOTE: at today DDC4 requires a different PC software, called DD4SW.