> HYDRAULIC PRODUCTS

Main Hydraulic Manifolds

Auxiliary Hydraulic Manifolds

> ELECTRONIC PRODUCTS

MMS (Machine Management System)

Base and Basket Control Boxes

Joystick Controllers, Fingertip Levers, Multi-Function Grips

Radio Remote Controls

Proportional inclinometers

> REFERENCES

TIME VERSALIFT - Denmark/USA

TEUPEN - Germany

CTE - Italy

AIRO / TIGIEFFE - Italy

CMC - Italy

OIL & STEEL - Italy

"SPIDER" AERIAL PLATFORM

SELF-PROPELLED

SCISSOR LIFT

AERIAL PLATFORM ON VAN

Customer **HYEN - Korea** 03-mar-16

Subject **Presentation of TECNORD Product line for AERIAL PLATFORMS**

INDEX:

TECNORD Srl Via Malavolti 36
41122 Modena - Italy
Tel. +39.059.254895 - Fax + 39.059.253512 - e-mail: tecnord@tecnord.com

Subject **Presentation of TECNORD Product line for AERIAL PLATFORMS**

1. SINGLE FUNCTION ELECTRO-HYDRAULIC SYSTEM (Combined ON-OFF Function selection of 1 function at-a-time and PROPORTIONAL

Control configuration: 3/4/5/6 solenoid operated ON-OFF type FUNCTION SELECTOR VALVES with 3-WAY, PROPORTIONAL FLOW REGULATOR for meter-in control of pump flow
Max. Pump Flow: 25 lt/min
Max. Work Pressure: 250 bar

Operating mode: combined ON-OFF and PROPORTIONAL control of one function at-a-time

2. DUAL MODE ELECTRO-HYDRAULIC SYSTEM

Control configuration: 2 ea banks of 2/3/4 solenoid operated ON-OFF type FUNCTION SELECTOR VALVES with 2 ea PROPORTIONAL FLOW REGULATORS for independent , dual meter-in control of each bank.

Max. Pump Flow: 35 lt/min
Max. Work Pressure: 250 bar

Operating mode: combined ON-OFF and PROPORTIONAL control of two functions at-a-time

3. MULTI-FUNCTION/ PRESSURE COMPENSATED DIRECTIONAL /PROPORTIONAL SYSTEM WITH LOAD SENSE

Control configuration: 3/4/5/6 ELECTRO-HYDRAULIC DIRECTIONAL/PROPORTIONAL SECTIONAL VALVES with DIRECT ACTING PROPORTIONAL SOLENOIDS and individual PRESSURE COMPENSATORS

Max. Pump Flow: 40 lt/min
Max. flow /section: 27 lt/min
Max. Work Pressure: 250 bar

Operating mode: simultaneous operation of 2 or more functions in a load sense mode (limited by pump flow saturation)

4. JOYSTICK CONTROLLERS

- Mini / Single Axis /Uni-directional control
- Mini / Single axis / Bi-directional control
- Multi-function /Dual-axes / With add-on Push Buttons and Rollers

5. PWM DRIVERS AND MMS (Machine Management Systems)

- Single Channel PWM driver for SINGLE FUNCTION control
- MMS / Micro-processor based Machine Management Systems for multi-function control control functions

6. COMPLETE CONTROL SYSTEMS

- Base and Basket control boxes and harness for SINGLE FUNCTION and DUAL MODE systems
- BASE AND BASKET control panels with auxiliary LOAD LIMITER and a SELF-LEVELING control devices

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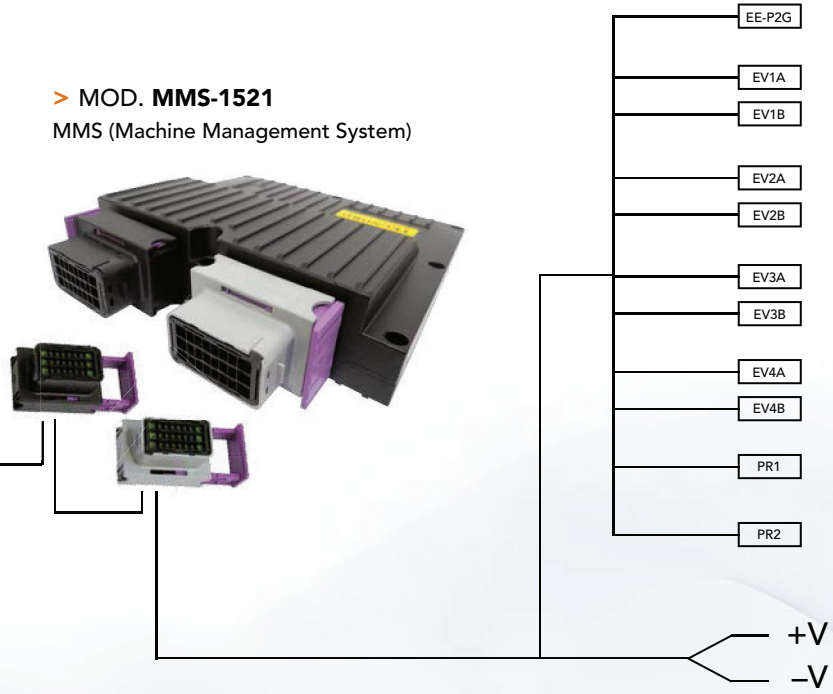
TECNORD
SERVOCOMANDI E REGOLAZIONE

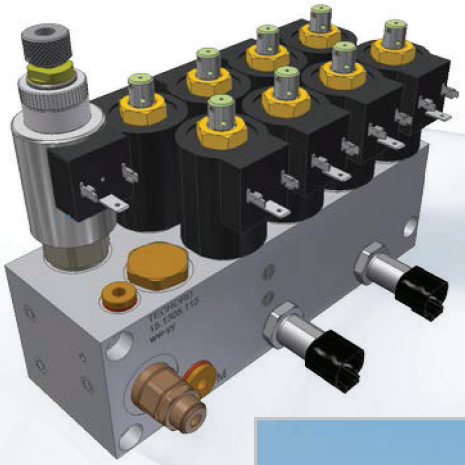
COMBINED DIRECTIONAL (ON-OFF FUNCTION SELECTION) AND PROPORTIONAL (METER-IN CONTROL OF PUMP FLOW) OF A 4-SECTIONS ELECTRO-HYDRAULIC SYSTEM

> MOD. **JLP-FTC**
Fingertip control levers

> MOD. **MMS-1521**
MMS (Machine Management System)

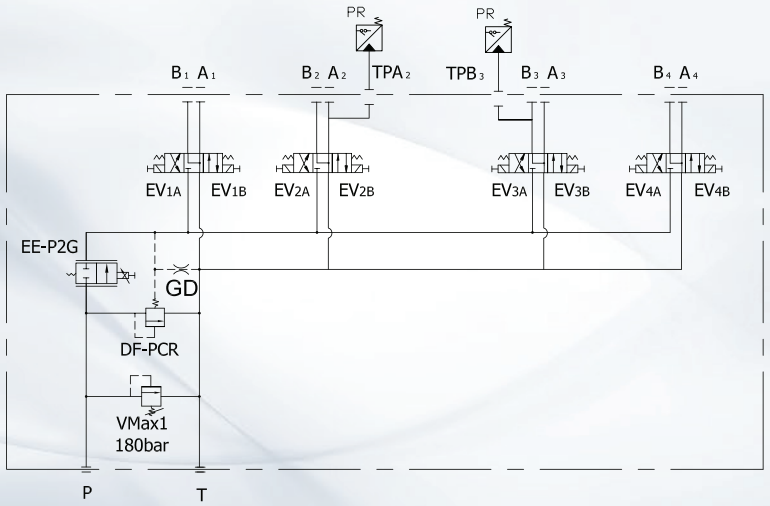


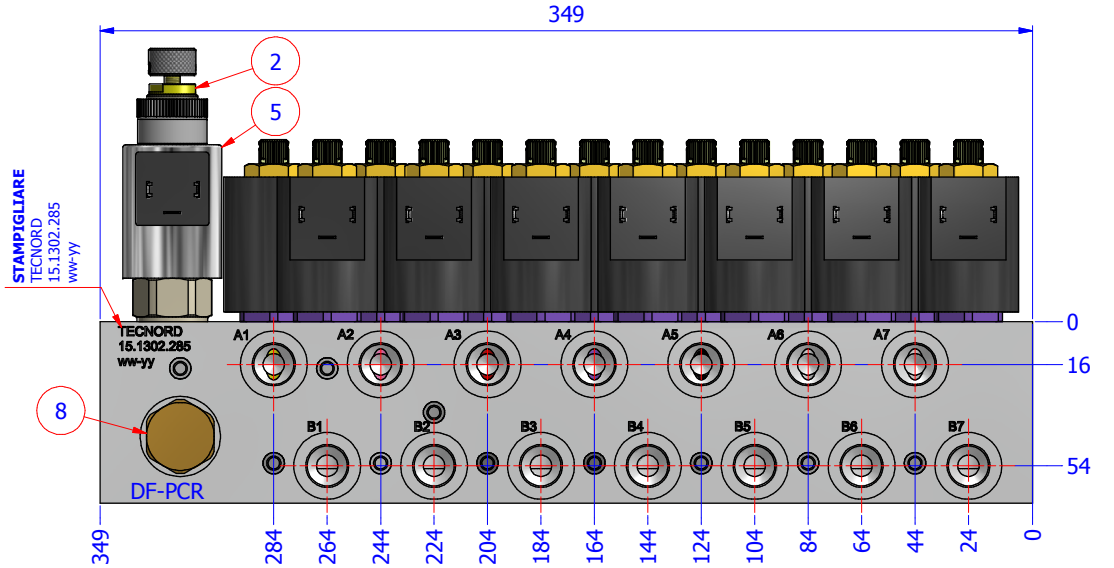
> MOD. **VOM-4F-32-FRS2G**
Electro-hydraulic manifold block with 4 ea ON-OFF bi-directional selector valves and 3way, pressure compensated flow regulator for meter-in control of pump flow

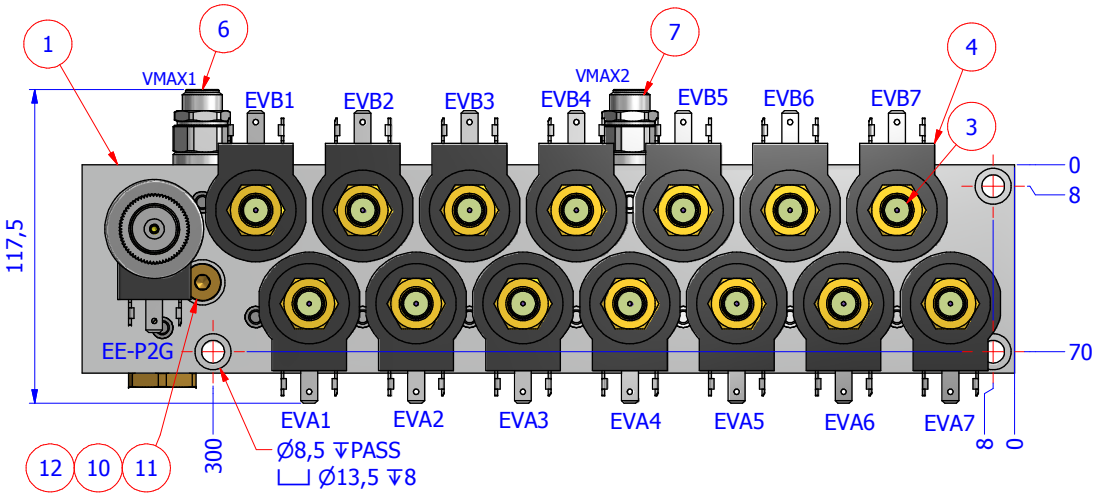


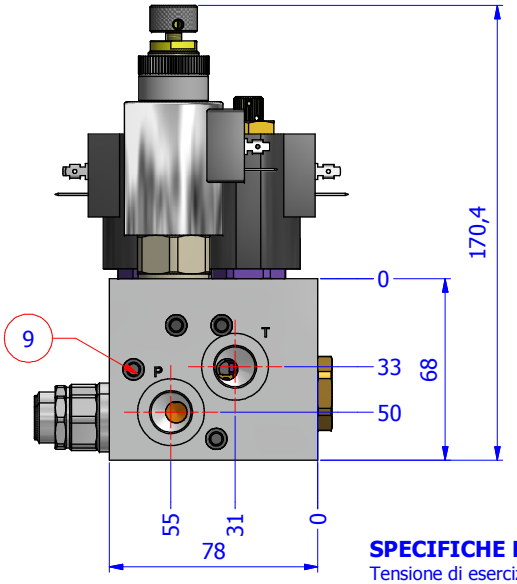
TRUCK-MOUNTED AERIAL PLATFORM

> **HYDRAULIC DIAGRAM**









DIMENSIONE LUCI:

P,T = 3/8"GAS
A1...A7 = 3/8"GAS
B1...B7 =3/8"GAS

SPECIFICHE IDRAULICHE

Portata massima in ingresso:	16 lt/min
Portata regolata:	0-16 lt/min
Pressione massima di esercizio:	200 bar
Range di controllo portata:	Vedi Grafico
Campo di temperatura di lavoro:	-25°C/+95°C

SPECIFICHE ELETTRICHE

Tensione di esercizio:	12 VDC ±15%
Resistenza delle bobine:	ON/OFF coils:5.9 Ohm @ 20°C Proportional coils: 7.2 Ohm @ 20°C
Corrente assorbita:	ON/OFF coils:1.9 Amp Proportional coils: see graph
Campo di temperatura di lavoro:	-25°C/+95°C
Connettori:	DIN 43650 (Hirschmann)

Pos.	DESCRIZIONE	QTÀ	Codice
12	GRANO M6x6 UNI 5923	1	60.1005.041
11	TAPPO G1/8" DIN 908	1	60.1204.006
10	Rondella G 1/8 Rame	1	60.1108.006
9	TAPPO Ø8 ACCIAIO	32	60.1207.042
8	DF-PCR 200 psi	1	65.4406.015
7	VALVOLA DI MAX (71-180 bar)	1	60.0203.184
6	VALVOLA DI MAX (181-280 bar)	1	60.0203.189
5	Magnete IHC 12V	1	60.0205.173
4	Magnete VHC 12V - 24W	14	60.0205.133
3	DF-S3A-OMT	14	14.0203.126
2	EE-P2G-OV-A1 (16 LT)	1	14.0107.021
1	COLLETTORE ALLUMINIO	1	13.1006.572

G F E D C B A

MODIFICHE APPROVATE

DESCRIZIONE: GRUPPO ELETTRO-IDRAULICO PER ELEVATORE 7F - ON/OFF 12V -

SOSTITUISCE IL: -

SOSTITUITO DA: -

TRATT. SUPERFICIALE:

TRATT. TERMICO:

MATERIALE:

NOME FILE: 15.1302.285_01.idw

MASSA: 5,924 kg

SCALA: -

DATA: 13/02/2014

N° FOGLIO: 1/1

SF.

A3

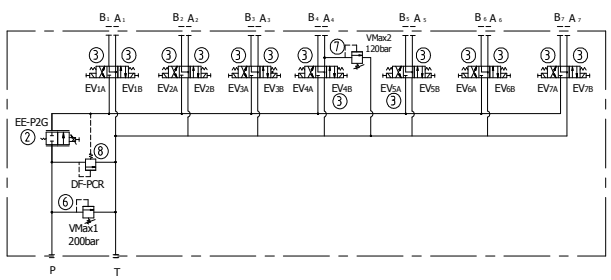
CLIENTE	RUG. GEN.	COMPLESSIVO	DISEGNATO	VERIF.	APPROV.
-	3.2	-	A.B.	D.D.	

CODICE -15.1302.285/01

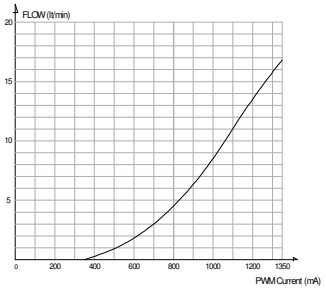
QUOTE SENZA TOLLERANZA: da 0 a 1: ±0.05 | da 1 a 80: ±0.1 | da 80 a 200: ±0.15 | da 200 a 300: ±0.2 | da 300 a 600: ±0.3

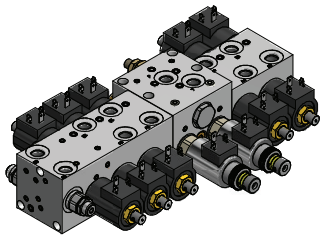
TECNORD
SERVOCOMANDI E REGOLAZIONE

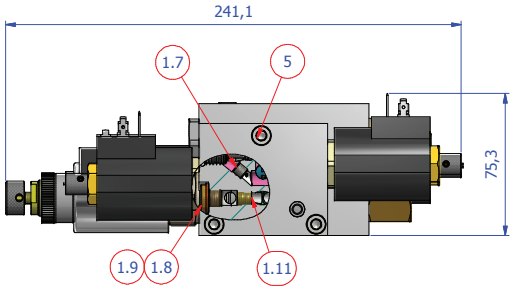
SCHEMA IDRAULICO



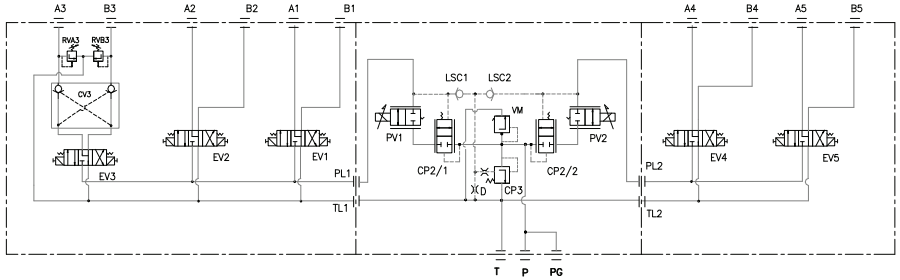
EE-P2G CONTROL CHARACTERISTIC
FLOW(lt/min) vs. CURRENT (mA)

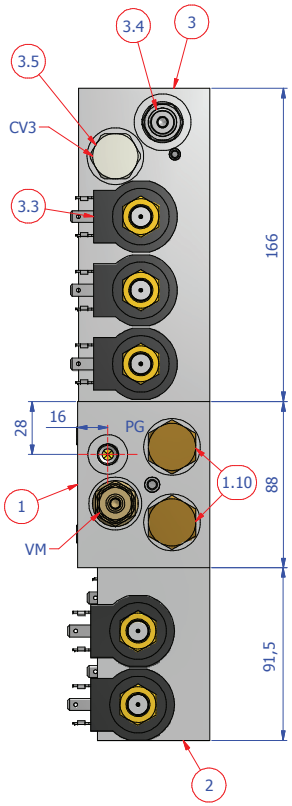


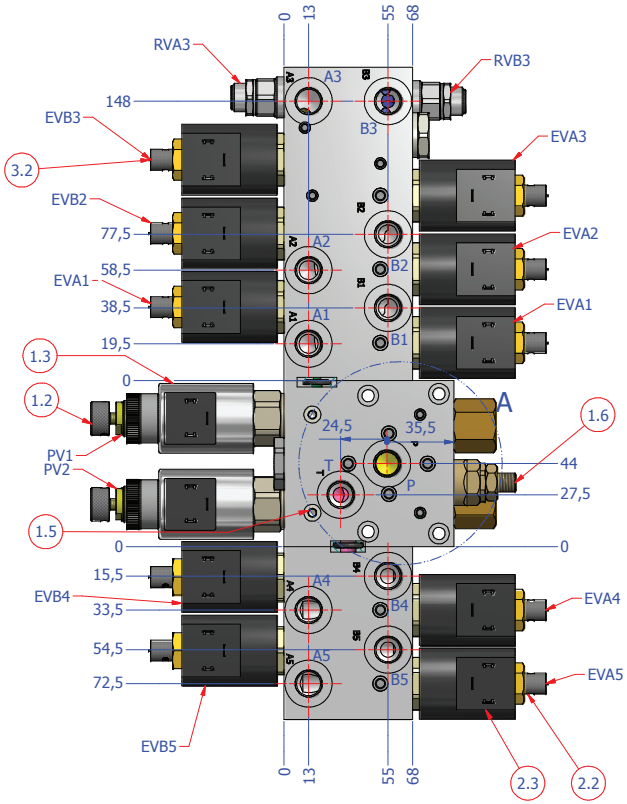


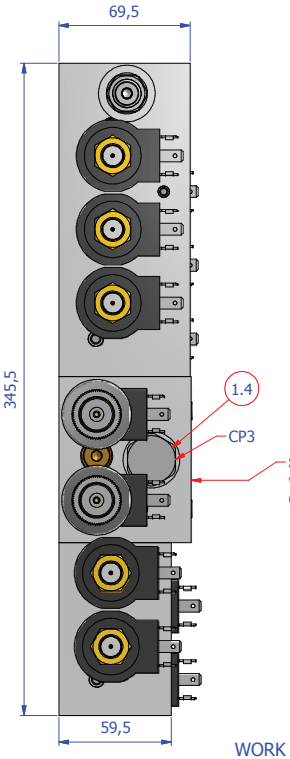


HYDRAULIC SCHEMATIC









STAMP:
ww-yy
COD TECNORD

ELECTRICAL SPECIFICATIONS

Operating Voltage:	12 VDC ±15%
Coil Resistance:	ON/OFF coils:5.9 Ohm @ 20°C Proportional coils: 7.2 Ohm @ 20°C
Max Current Consumptio:	ON/OFF coils:1.9 Amp Proportional coils: see graph
Operating Temperature:	-25°C/+95°C
Degree of protection:	IP65
Prop. Current Range (PWM):	See Graph
Coil Termination:	DIN 43650 (Hirschmann)

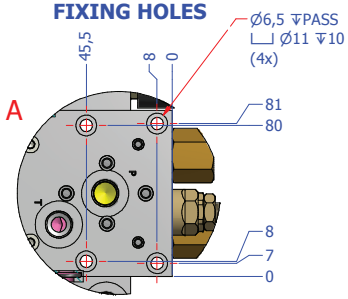
HYDRAULIC SPECIFICATIONS

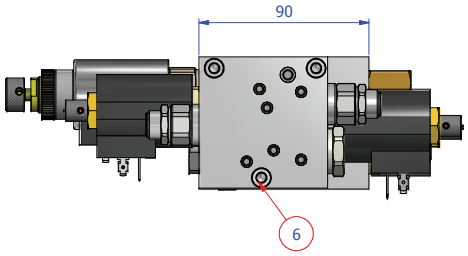
Max Inlet Flow:	25 lt/min
Max controlled flow/section:	0-15 lt/min
max Work pressure:	200 bar
Flow Control Range:	See graph
Fluid Temeprature Range:	-25°C/+95°C
Oil VIscosity:	3-650 cSt
Filtration:	18/15 (ISO 4406)

S.P. - SERVICEABLE PARTS

Pos.	DESCRIPTION	Q.TY	PART NUMBER	S.P.
6	Screw TCEI M6x160 UNI 5931	3	60.1002.083	Y3577
5	Screw TCEI M6x90 UNI 5931	3	60.1002.104	Y3576
4	OR 2-111 90SHORE	4	60.0108.089	Y3441
3.5	CHECK VALVE	1	65.4406.045	
3.4	RELIEF VALVE 180-280 BAR	2	60.0203.189	
3.3	ON/OFF COIL VHC 12V	6	60.0205.133	Y3574
3.2	ON/OFF VALVE DF-S3A-OK	6	14.0203.119	
3.1	ALUMINUM MANIFOLD	1	13.1002.090	
3	ON/OFF 3F unit - SAE ports	1	15.1301.263	
2.3	ON/OFF COIL VHC 12V	4	60.0205.133	Y3574
2.2	ON/OFF VALVE DF-S3A-OK	4	14.0203.119	
2.1	ALUMINUM MANIFOLD	1	13.1002.083	
2	ON/OFF 2F unit - SAE ports	1	15.1301.258	
1.12	COIL NUT	2	60.1010.208	Y3567
1.11	PLUG 1/16" NPTF	1	60.1005.505	Y3568
1.10	DF-CP2	2	14.2001.001	Y3564
1.9	WASHER G 1/8"	1	60.1108.001	
1.8	PLUG G 1/8 DIN 908	1	60.1204.006	
1.7	ORIFICE M6x6 Ø0.45+WIRE 0.4	1	60.1005.414	
1.6	RELIEF VALVE 121-250 BAR	1	60.0203.194	
1.5	CHECK VALVE QS-CVL	2	14.2403.017	
1.4	PRESSURE COMPENSATOR DF-PCR	1	65.4406.017	
1.3	PROP. COIL IHC 12V	2	60.0205.173	Y3566
1.2	PROP. VALVE EE-P2G-OV (16 LT)	2	14.0107.021	Y3565
1.1	ALUMINUM MANIFOLD	1	13.1002.089	
1	PROPORTIONAL CONTROL unit - SAE ports	1	15.1303.044	

FIXING HOLES



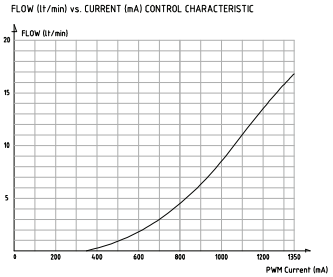


SETTING NOTES:

RELIEF VALVE VM (Pos.1.6) 200 bar @ 10 l/min
RELIEF VALVE RVA3-RVB3 (Pos.3.4) 220 bar @ 10 l/min

WORK SIZE PORTS:

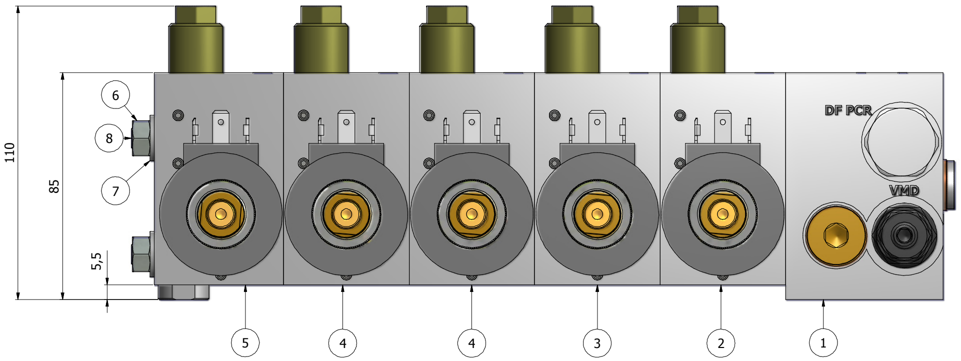
P,T: 9/16"- 18 UNF -SAE 6
A1,...,A5;B1,...,B5: 9/16"- 18 UNF -SAE 6
PG: 7/16"- 20 UNF -SAE 4

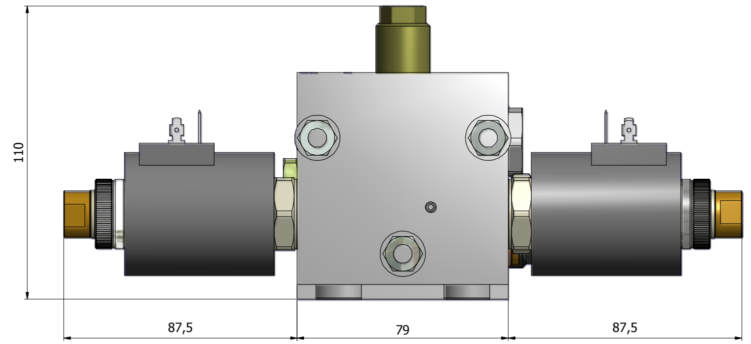


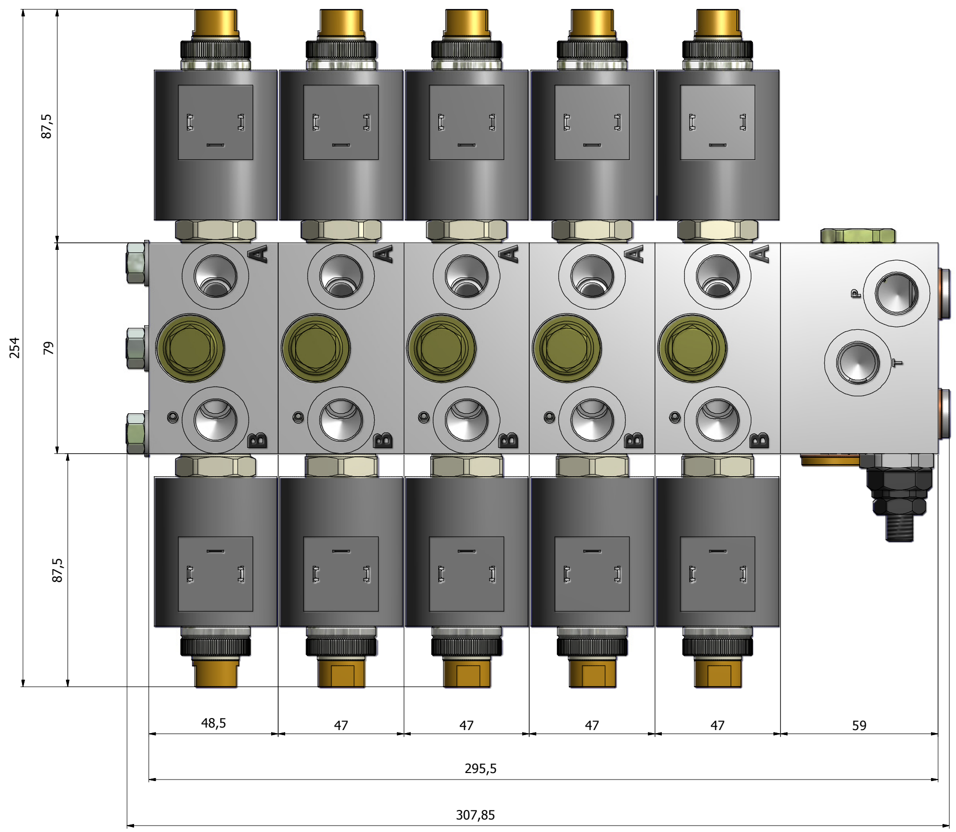
DESCRIZIONE:		SOSTITUISCE IL:	TECNORD
ELECTRO-HYDRAULIC DIRECTIONAL/PROPORTIONAL SYSTEM FOR AERIAL PLATFORM - 5 FUNCTIONS - SAE PORTS		SOSTITUITO DA:	SERVOCOMANDI E REGOLAZIONE
-TRATT. SUPERFICIALE:		NOME FILE: 40.1301.012_01.idw	SCALA 1:2 / DATA 04/10/2012 / N° FOGLIO 1/1
TRATT. TERMICO:			
MATERIALE:		MASSA: N/A	SF.1573.TMX / A2
CLIENTE: Time Export	RUG. GEN. 3.2 / COMPLESSIVO - / DISEGNATO A.B. / VERIF. D.D. / APPROV.		CODICE _40.1301.012 /01

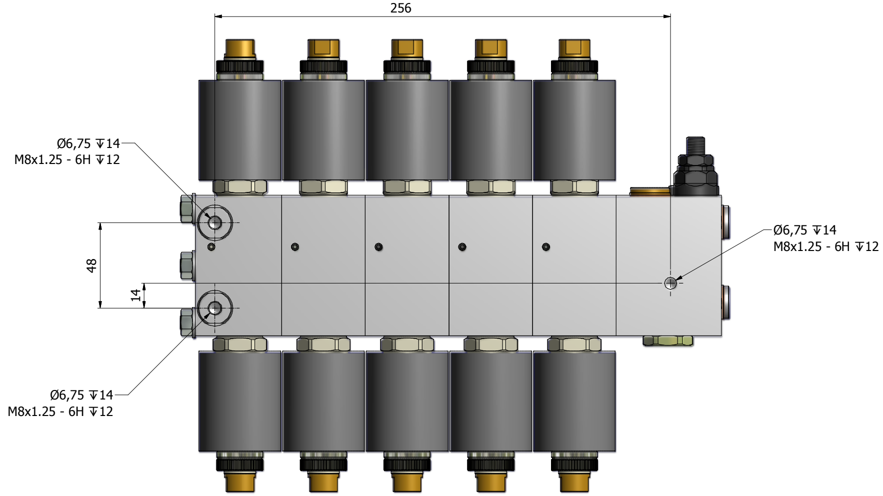
QUOTE SENZA TOLLERANZA: da 0 a 1: ±0.05 | da 1 a 80: ±0.1 | da 80 a 200: ±0.15 | da 200 a 300: ±0.2 | da 300 a 600: ±0.3

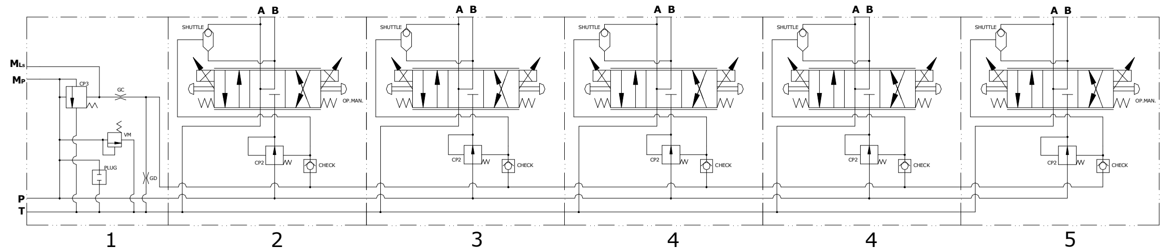
G F E D C B A
MODIFICHE APPROVATE











PORTE/PORTS	
P	G 3/8"
T	G 3/8"
A / B	G 3/8"
M_P	G 3/8"
M_{LS}	G 3/8"

Elenco parti			
ELEMENTO	QTÀ	NUMERO PARTE	DESCRIZIONE
1	1	15.3901.004_00	TDV 31-IFCLG38-C15R25-12V
2	1	15.3903.008_00	TDV 32-PMDG38-OM-Y05-12V
3	1	15.3903.007_00	TDV 32-PMDG38-OM-Y10-12V
4	2	15.3903.006_00	TDV 32-PMDG38-OM-Y27-12V
5	1	15.3902.004_00	TDV 33-PMDG38-OM-Y27-12V
6	3	60.1010.008	Dado M8 UNI 5588
7	3	60.1006.078	Rondella piana Ø8x17x1,6 UNI 6592 - Zn
8	3	13.9001.075	Tirante M8x18 L=255 TDV30 5F

G	F	E	D	C	B	A
-	-	-	-	-	-	-

MODIFICHE APPROVATE

DENOMINAZIONE:
TDV30 5 SEZ.

SOSTITUISCE IL: -

SOSTITUITO DA: -

TECNORD
SERVOCOMANDI E REGOLAZIONE

TRATT. SUPERFICIALE: -

TRATT. TERMICO: -

NOME FILE: 15.4002.004.idw

SCALA	DATA	N° FOGLIO
1:1	28/06/2010	1/1

MATERIALE: -

SF .1299.TMX

CLIENTE	COMPLESSIVO	DISEGNATO	CONTR.	APPROV.
TIME EXPORT	-	F.S.	B.B.	-

CODICE
15.4002.004 / -

QUOTE SENZA TOLLERANZA: da 0 a 1: ±0.05	da 1 a 80: ±0.1	da 80 a 200: ±0.15	da 200 a 300: ±0.2	da 300 a 600: ±0.3

FTH-L1S CONTACTLESS FINGERTIP PROPORTIONAL CONTROL LEVER

FEATURES

- Single axis / unidirectional.
- Contactless, hall effect sensor.
- Optional “out of neutral” switch.
- Optional dual sensor (redundant).

MECHANICAL SPECIFICATIONS

Lever deflection angle:	50° ±1°
Electrical angle:	50° ±1°
Operating temperature range:	-25°C / +80°C
Protection class:	IP 67
Life:	> 3 million cycles (without switch)
Connector:	molex CGRID/SL, 7 male pins

ELECTRICAL SPECIFICATIONS

Linear, hall-effect sensor

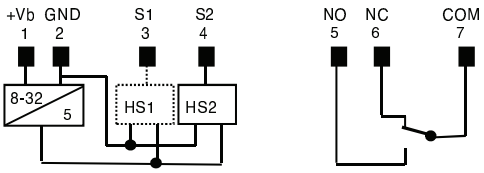
Power supply voltage:	8÷32 VDC
Current consumption:	< 15 mA (30 mA with 2 sensors)
Output signal in neutral:	< 0.1 V
Output signal range:	0.5 V ÷ 4.5 V
Tolerance on output signal:	±0.1 V
Linearity:	< 2%
Max. output current:	1 mA
Directional switch operating voltage:	< 48 VDC
Directional switch max. current:	1 A

Neutral position switch (electromechanical type)

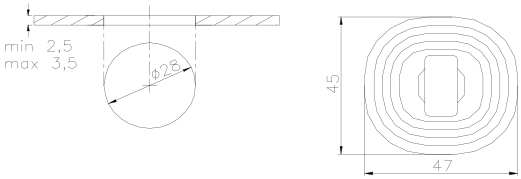
Contacts:	silver plated (solder type)
Max. operating input voltage:	48 V or ±24 V
Max. operating current:	1 A
Neutral pos. switch threashold angle:	7°
Protection class:	IP 67

ELECTRICAL CONNECTIONS

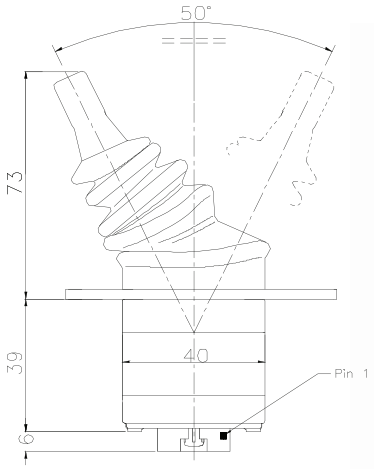
HS1: optional



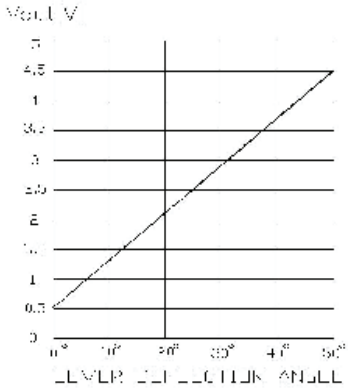
PANEL CUT-OUT AND MOUNTING



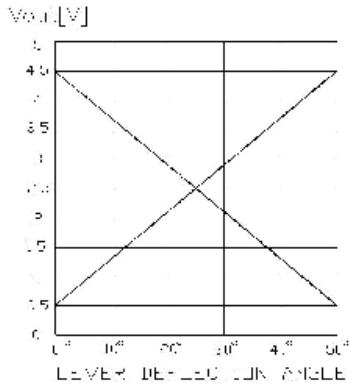
OVERALL DIMENSIONS



OUTPUT SIGNAL CONTROL CHARACTERISTIC



FTH-L1S/SN
(single channel)



FTH-L1S/TW
(dual channel)

FTH ORDERING INFORMATION: see page JK5

W 3 / 2016

Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • **www.delta-power.com**

TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • **www.tecnord.com**

FTH-L2S CONTACTLESS FINGERTIP PROPORTIONAL CONTROL LEVER

FEATURES

- Single axis / bidirectional.
- Contactless, hall effect sensor.
- Optional “out of neutral” switch.
- Optional dual sensor (redundant).

MECHANICAL / ENVIRONMENTAL SPECIFICATIONS

Lever deflection angle:	±25° ±1°
Electrical angle:	±25° ±1°
Operating temperature range:	-25°C / +85°C
Protection class:	IP 67
Life:	> 3 million cycles (without switch)
Connector:	molex CGRID/SL, 7 male pins

ELECTRICAL SPECIFICATIONS

Linear, hall-effect sensor

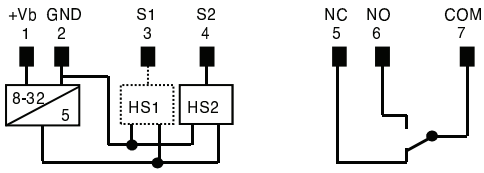
Power supply voltage:	8÷32 VDC
Current consumption:	< 15 mA (30 mA with 2 sensors)
Output signal in neutral:	2.50 V ±0.1 V
Output signal range:	0.5 V ÷ 4.5 V
Tolerance on output signal:	±0.1 V
Linearity:	< 2%
Max. output current:	1 mA
Directional switch operating voltage:	< 48 VDC
Directional switch max. current:	1 A

Neutral position switch (electromechanical type)

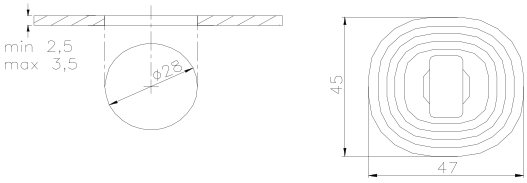
Contacts:	silver plated (solder type)
Max. operating input voltage:	48 V or ±24 V
Max. operating current:	1 A
Neutral pos. switch threashold angle:	7°
Protection class:	IP 67

ELECTRICAL CONNECTIONS

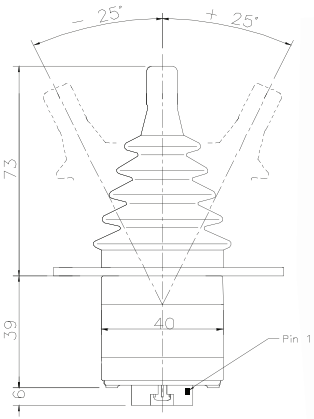
HS1: optional



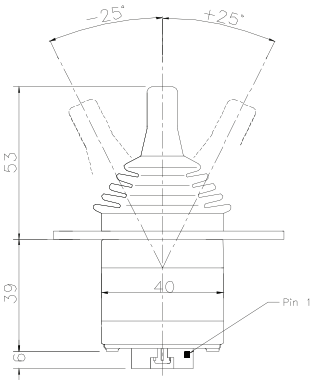
PANEL CUT-OUT AND MOUNTING



OVERALL DIMENSIONS

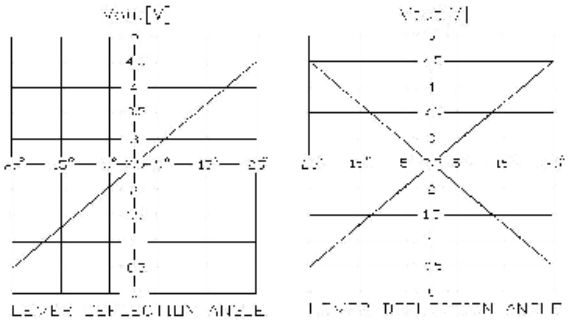


Paddle type high



Paddle type low

OUTPUT SIGNAL CONTROL CHARACTERISTIC



FTH-L2S/SN (single channel) **FTH-L2S/TW** (dual channel)

FTH ORDERING INFORMATION: see page JK5

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JHM HEAVY DUTY MULTI-AXIS HALL EFFECT JOYSTICK

JHM joystick with grips - configuration examples with overall dimensions

JHM base with MS type handle
Complete code: **JHM L4D/ANH-MS A6P9 R3P9**

JHM base with MS type handle
Complete code: **JHM L4D/ANH-MS A2P9 2FPR R1P9**

JHM base with MG type handle
Complete code: **JHM L4D/ANH-MG A4P9 R1P9**

JHM base with MG type handle
Complete code: **JHM L4D/ANH-MG A2P9 1FPR 0000**

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EC-PWM-A1-MPC1-P PWM DRIVER

DESCRIPTION

Microprocessor-based PWM electronic driver for remote control of a single proportional solenoid valve.

OPERATION

The EC-PWM-A1-MPC1-P proportional valve driver receives a command signal from a potentiometer, PLC or other control systems, and supplies a solenoid with a PWM (Pulse Width Modulated) current proportional to the input signal. An auxiliary power supply (+5 V) is provided as a reference for the command signal. Adjustments of “Imin/Imax”, “Ramp time” and “Dither” can be carried out directly from a key-pad integrated on the front panel.

Mounting option: panel-mounting style with INPUT/OUTPUT multi-core sheated cable.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Power supply line is protected against reversed polarity and load dump.
- Input is protected against short circuits to GND and power supply.
- Output is protected against short circuits, over-current and over-temperature.
- The EC-PWM-A1-MPC1 is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

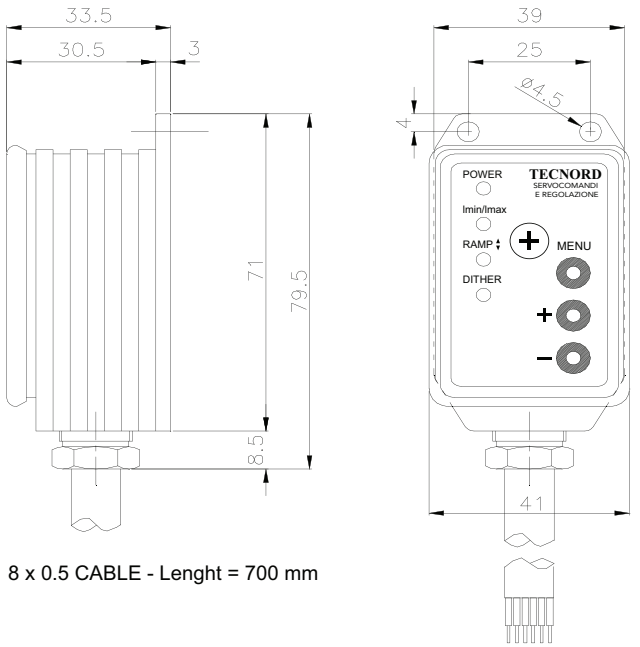
SPECIFICATIONS

Operating voltage:	8.5÷30 VDC
Max current consumption:	100 mA (no load applied)
Operating temperature:	-25°C / +85°C
Input resistance 0÷5 V voltage input:	560 KOhms
0÷10 V voltage input:	1 MOhm
0÷20mA current input:	250 Ohms
Degree of protection:	IP 67
Analog input signals available:	0÷5 V
	0÷10 V
	0÷20 mA
Typical ctrl pot resistance:	2÷47 kΩ
Current output range (PWM):	100÷3000 mA
PWM dither frequency:	55÷200 Hz (adjustable)
Ramp time:	0.05÷5 s (adjustable)
Max. current from auxiliary +5 V:	15 mA

APPLICATIONS

Primary applications are the control of proportional pressure reducing valves and proportional flow regulators to attain smooth acceleration/deceleration and fine-metering control of electro-hydraulic functions.

DIMENSIONS



8 x 0.5 CABLE - Lenght = 700 mm

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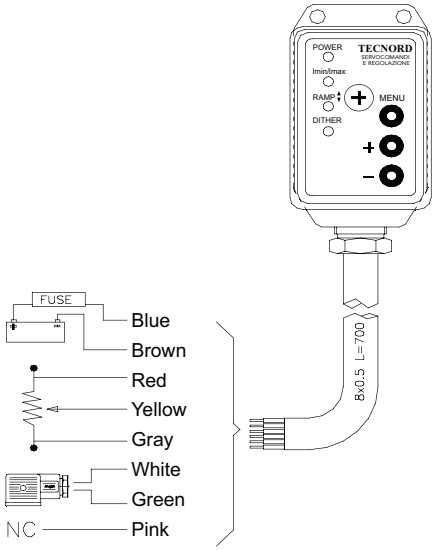
EC-PWM-A1-MPC1-P PWM DRIVER

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Wiring Colours

Blue	+Battery
Brown	-Battery (GND)
Red	Command signal supply (+5 V)
Yellow	Command signal in
Gray	Command signal GND
White	Proportional coil output
Green	Proportional coil current feedback line
Pink	Spare / Not used

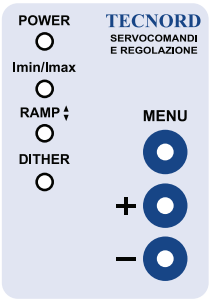
Note
A 5A fuse must be inserted on the BLUE wire connecting the PWM driver to the power source.



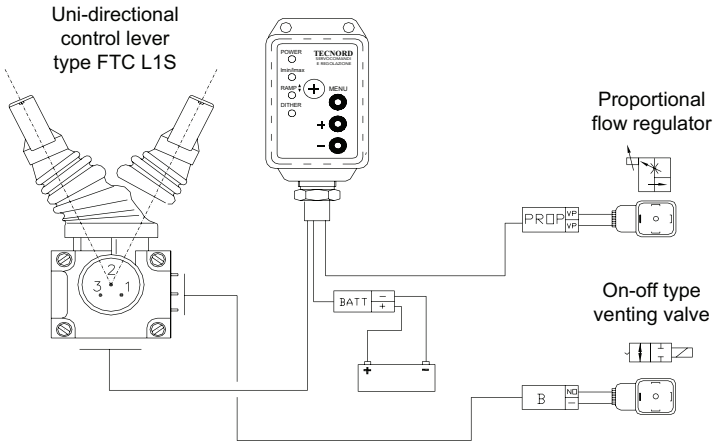
ADJUSTMENTS

The following adjustments can be made directly from the front key-pad by selecting the 3-pushpins in appropriate combinations:

- **Imin (minimum output current)**
- **Imax (maximum output current)**
- **Ramp-up time**
- **Ramp-down time**
- **Dither frequency**



APPLICATION EXAMPLE



Remote operation of a proportional flow control valve from single axis/unidirectional control lever incorporating a rotary potentiometer and a center/power-off switch for the energization of an auxiliary solenoid-operated dump valve.

ORDERING INFORMATION

EC-PWM-A1-MPC1-P

A = Adjustable

P = Panel mounting

Part numbers	*Version*
23.0409.045	0-5 V
23.0409.087	0-10 V
23.0409.136	0-20 mA

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EC-MMS-1521-H MACHINE MANAGEMENT SYSTEM CONTROLLER

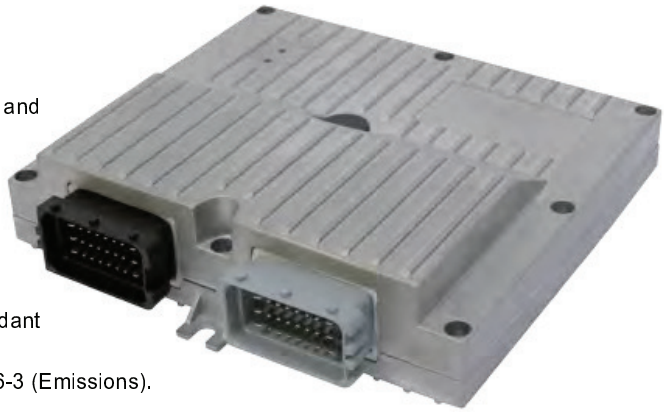
DESCRIPTION

MMS (Machine Management System) controller in rugged aluminum enclosure dual microprocessor, CANbus, built-in safety and fault-detection features for integrated control of complex functions in mobile equipment applications.

OPERATION

It is normally used as the main control unit in a complete management system. Two microprocessors and advanced diagnostics for safety applications. The EC-MMS-1521 comes with an aluminium casing, a silicon rubber gasket and connectors, designed to ensure power dissipation, robustness and tightness required in severe environment conditions. Software download available.

FEATURES



- Robust aluminum enclosure.
- Power supply is protected against reversed polarity (external fuse required) and overvoltage.
- Inputs are protected against short circuits to GND and power supply.
- Outputs protected against short circuits, over-current and over-temperature.
- 2 CANbus connections.
- PWM drivers with current feedback.
- +5 V auxiliary power supply for external control devices.
- Performance level d capability according to ISO 13849, thanks to redundant microcontroller and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).
- Reserved power supply pins for safety power outputs.
- Optional add-on inclinometer.
- Optional real time clock for data logging.

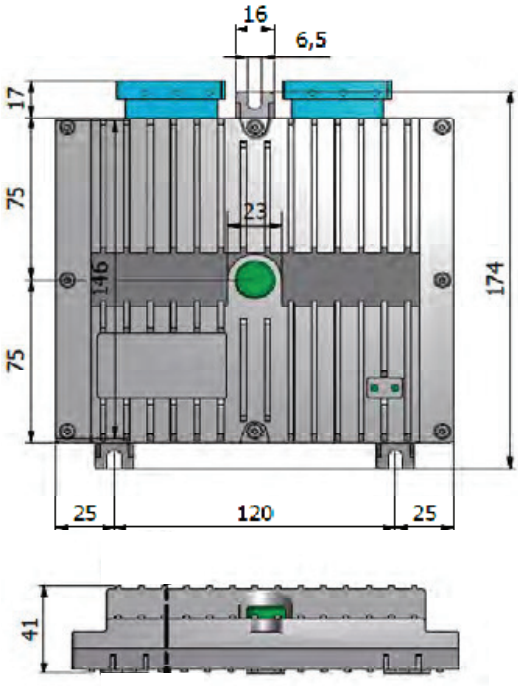
SPECIFICATIONS

Operating voltage:	8÷32 VDC
Max. current consumption:	< 400 mA (no load applied)
Operating temperature:	-40°C / +105°C
Degree of protection:	IP 69
Analog inputs (16 bits):	3 (0-5 V)
Analog inputs (10 bits):	8 (0-5 V)
Digital (frequency) inputs:	4
High side power outputs:	18 (6 if PWM outputs are used)
Low side power outputs (LS):	2
PWM outputs with current feedback (3A):	12
Analog voltage outputs (0-5 V):	1
Pins selectable as power OUT or digital IN:	6
Inputs with SW selectable pull-up:	4
CANbus lines:	2 (ISO 11898, CAN 2.0A/B)
Available bus speed:	up to 1 Mbit/s

APPLICATIONS

- Main ECU for aerial platforms, cranes, telehandlers, agriculture vehicles.
- 12 VDC and 24 VDC systems.
- Two or more MMS boards can be interconnected through the CANbus line.

DIMENSIONS



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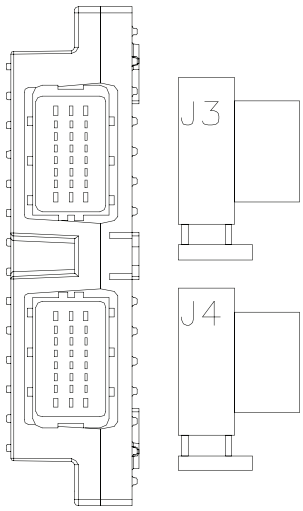
EC-MMS-1521-H MACHINE MANAGEMENT SYSTEM CONTROLLER

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Connector type: framatome SICMA2



J3 (GREY)

A		B		C	
1	VHS4	1	LS1	1	LS0
2	OUT_PWM7	2	OUT_PWM6	2	5V EXT
3	OUT_PWM2	3	ANALOG IN 8	3	ANALOG IN 9
4	OUT_PWM3	4	ANALOG IN 10	4	CAN L 1
5	DIG INT 1	5	DIG INT 3	5	CAN H 1
6	DIG INT 0	6	DIG INT 2	6	CAN L 2
7	OUT_PWM4	7	OUT_PWM5	7	CAN H 2
8	VHS3	8	VHS2	8	VHS1

J4 (BLACK)

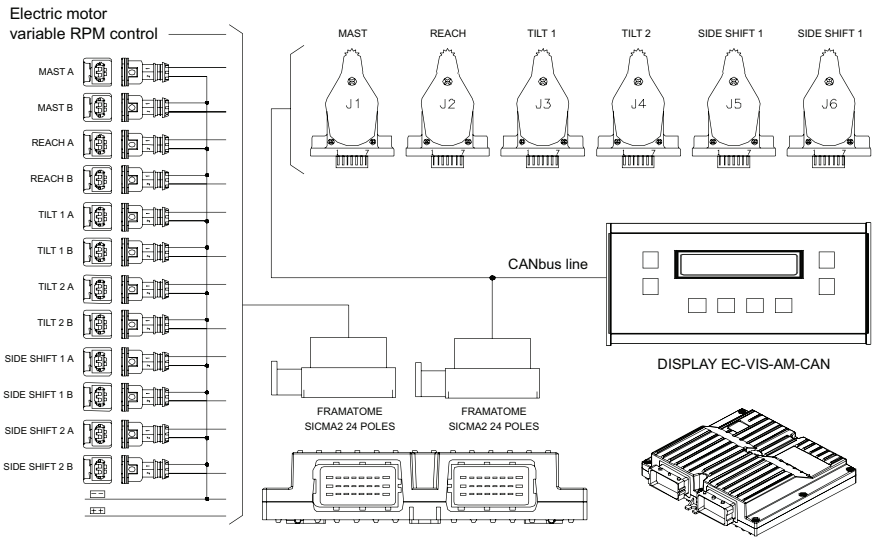
A		B		C	
1	OUT 4	1	OUT 2	1	OUT_PWM0
2	OUT 5	2	OUT 3	2	OUT_PWM1
3	OUT 0	3	ANALOG IN 1	3	ANALOG IN 0
4	OUT 1	4	ANALOG IN 3	4	ANALOG IN 2
5	OUT_PWM8	5	ANALOG IN 5	5	ANALOG IN 4
6	OUT_PWM9	6	ANALOG IN 7	6	ANALOG IN 6
7	OUT_PWM10	7	OUT_PWM11	7	OUT AN 0
8	+V (POWER SUPPLY)	8	-V (POWER SUPPLY - GND)	8	-V (POWER SUPPLY - GND)

ADJUSTMENTS

MMS controllers have a customized firmware to fulfill machine functions.
A customized calibration tool is available to set main working parameters.

Ask for: PC calibration tool
(see page EC44)

APPLICATION EXAMPLE



Forklift control system

ORDERING INFORMATION

EC-MMS-1521-H

1521 = 15 inputs - 21 outputs

H = aluminium Housing

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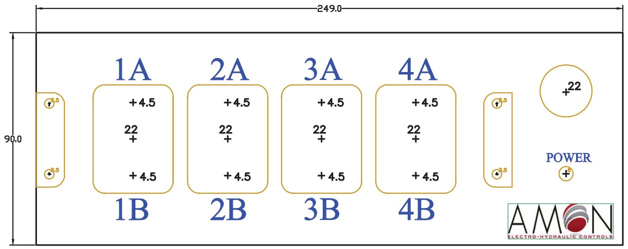
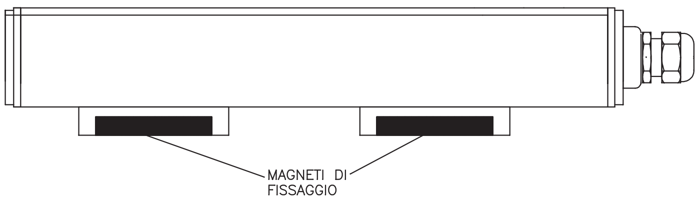
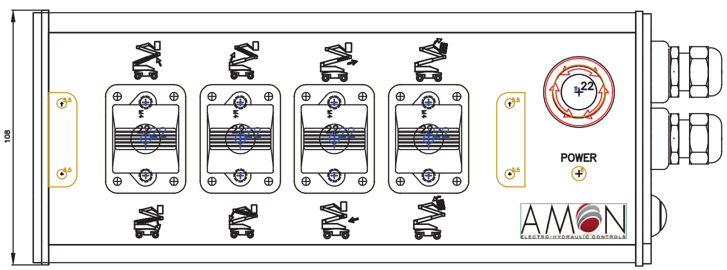
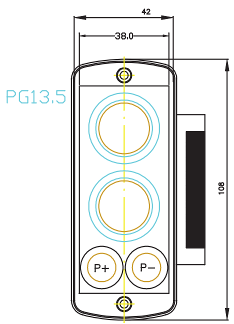


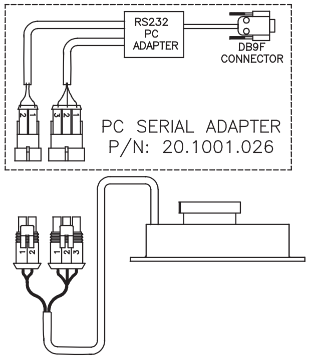


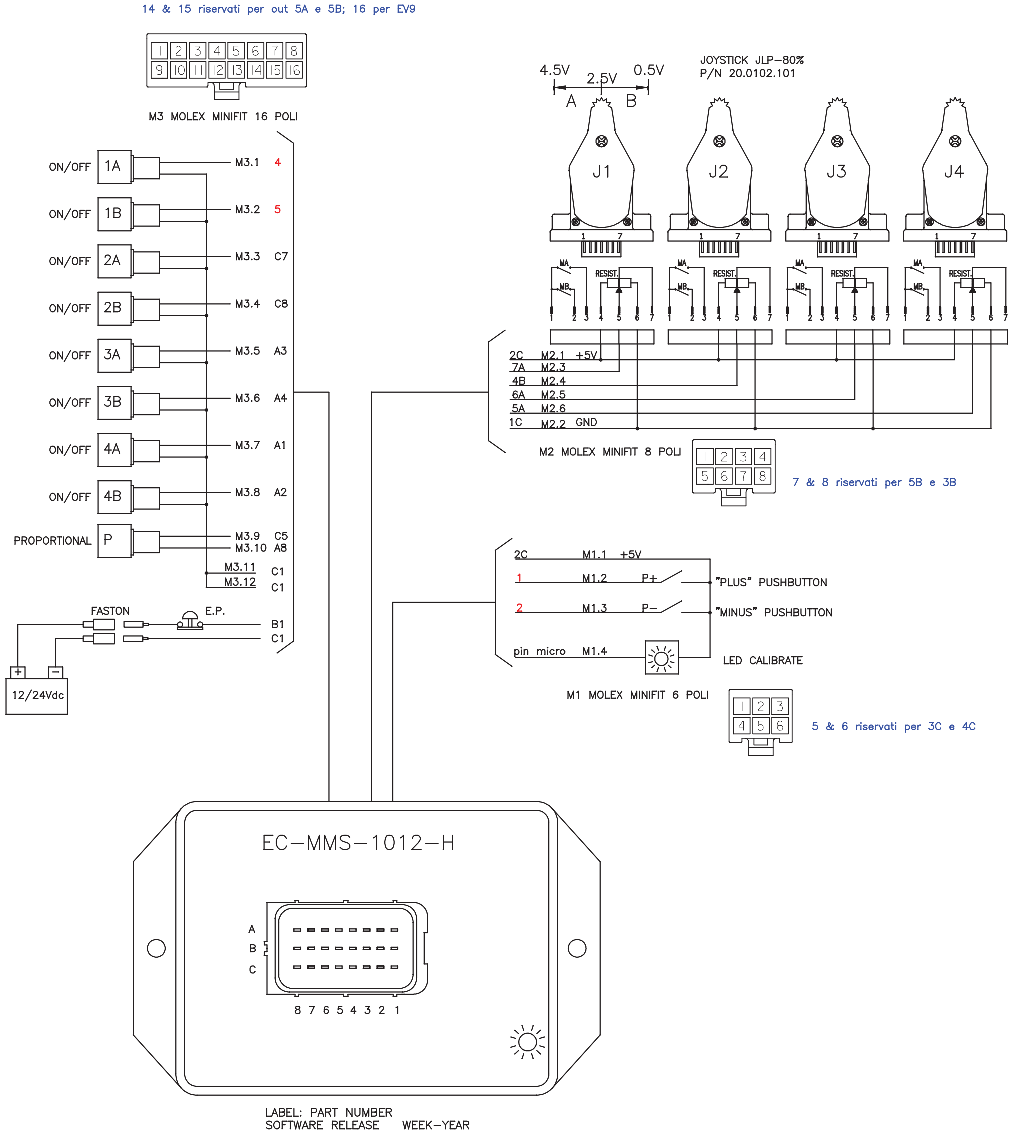


22.0504.152/00



Pulsanti di calibrazione:
P+ (rosso) per incrementare;
P− (nero) per decrementare.





CONTROLLER: P/N: 23.0409.177

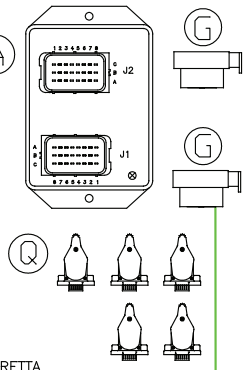
DENOMINAZIONE: SISTEMA DI CONTROLLO			SOSTITUISCE il N° .		TECNORD
PER IMPIANTO 4F METER IN					
VISTA D'ASSIEME			SOSTITUITO dal N° .		SCALA 1:1 — DATA 29/05/13 — Foglio 1 di 1
Tratt.Termico:					
MATERIALE:		DIS. AZ	CONTR. GR	APPROV. PM	DISEGNO N°
COMMESSA .	CLIENTE AMI	COMPLESSIVO SF.1549.TCN	N° ARCHIVIO .		Percorso: UTE\SF\1549.TCN\DISEGNI\SF.1549.TCN.000.dwg
QUOTE SENZA TOLLERANZA: da 1 a 80: ±0,1	da 80 a 200: ±0,15	da 200 a 300: ±0,2	da 300 a 600: ±0,3		SF.1549.TCN.000/.

G F E D C B A

CESTELLO

OUTPUTS:
1 BUZZER CENTRO CESTO
2 SPIA CENTRO CESTO
3 SPIA CATENA
4 SPIA CELLA
5 SPIA ON
6 BUZZER CELLA

INPUTS:
1 PEDALE UP
2 MICRO ANTENNA
3 MICRO CENTRO CESTO
4 START MOTORE
5 STOP MOTORE
6 JOYSTICK PANTOGRAFO
7 JOYSTICK BRACCIO
8 JOYSTICK TELESCOPICO
9 JOYSTICK ROTAZIONE TORRETTA
10 JOYSTICK ROTAZIONE CESTO



CESTELLO

M — CELLA DI CARICO RIDONDANTE (FORNITURA CTE)

L — CENTRALINA AMPLIFICATORE PER CELLA DI CARICO RIDONDANTE E GESTIONE CAN
P.N. 23.0406.021/00

P — KIT CONN. AT06-12S P/N 13.0310.708

1 ++
2 GND
3 CANH
4 CANL
5 INCL1.1
6 INCL1.2
7 INCL2.1
8 INCL2.2
9 SEGNALE1
10 SEGNALE2
11 +5Vdc
12 nc

AT04-12P AT06-12S

(DIM. in mm 192X168X80)

BRACCIO

H — SENSORE ANALOGICO DI SFILO (L=5m) RIDONDANTE
P.N. 21.0809.023/00

1 +5Vdc
2 GND
3 SEGNALE 1
4 SEGNALE 2

AT04-4P AT06-4S

N

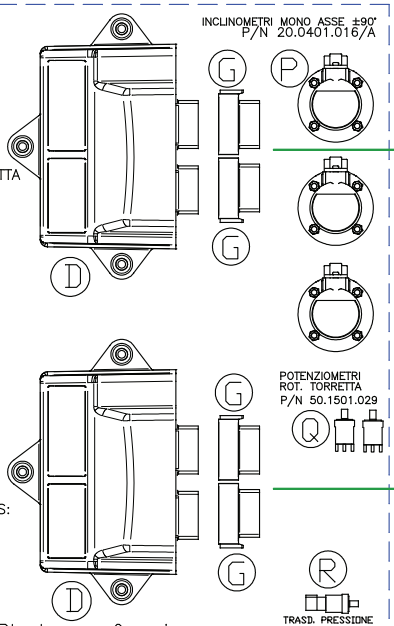
TORRETTA

INCLINOMETRI MONO ASSE ±90°
P/N 20.0401.016/A

INPUTS:
1 ANGOLO BRACCIO
2 ANGOLO ROTAZIONE TORRETTA
3 ANGOLO PANTOGRAFO
4 TRAVERSA AD
5 TRAVERSA PD
6 TRAVERSA AS
7 TRAVERSA PS

OUTPUTS:
1 EVPROP 1
2 EVPANTOGRAFO SU
3 EVPANTOGRAFO GIU
4 EVBRACCIO SU
5 EVBRACCIO GIU
6 EVSFILO
7 EVRIENTRO
8 EVROT-TORRETTA CW
9 EVROT-TORRETTA CCW
10 EVROT-CESTO CW
11 EVROT-CESTO CCW
12 EVPROP 2
13 EVP29

POWER SUPPLY FOR OUTPUTS:
1 EVP29
2 EVBRACCIO SU
3 EVBRACCIO GIU
4 EVSFILO
5 EVROT-TORRETTA CW
6 EVROT-TORRETTA CCW

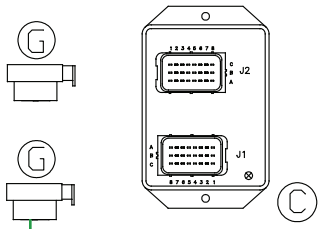


POTENZIOMETRI ROT. TORRETTA
P/N 50.1501.029

R — TRASD. PRESSIONE
P/N 50.2104.017
(N.6 DA VALUTARE)

(Pl=d per funzione limitatore geometrico)

PULSANTIERA CARRO



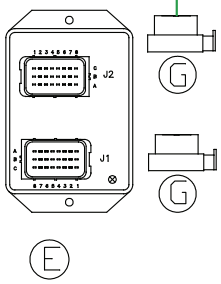
OUTPUTS:
1 BUZZER CENTRO CESTO
2 SPIA CENTRO CESTO
3 SPIA CATENA
4 SPIA CELLA
5 SPIA ON
6 BUZZER CELLA

INPUTS: Q
1 START MOTORE
2 STOP MOTORE
3 JOYSTICK
4 LEVETTA PANTOGRAFO SU
5 LEVETTA PANTOGRAFO GIU
6 LEVETTA BRACCIO SU
7 LEVETTA BRACCIO GIU
8 LEVETTA SFILO
9 LEVETTA RIENTRO
10 LEVETTA ROTAZIONE TORRETTA CW
11 LEVETTA ROTAZIONE TORRETTA CCW
12 LEVETTA ROTAZIONE CESTO CW
13 LEVETTA ROTAZIONE CESTO CCW

CARRO

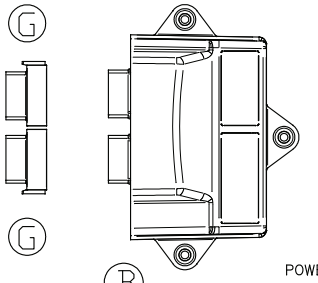
OUTPUTS:
1 SPIA STAB AD
2 SPIA STAB PD
3 SPIA STAB AS
4 SPIA STAB PS
5 SPIA ALLARME 1
6 SPIA ALLARME 2
7 RPA
8 RPB
9 RP66 (COMANDO EVS25)
10 START MOTORE
11 STOP MOTORE
12 ACCELERATORE MOTORE

INPUTS:
1 FUNGO
2 ALLARME MCS5/MCS6
3 NC RP1
4 FINE CATENA EVP29
5 COSTA PNEUMATICA
6 SEL. STABILIZZATORI
7 SEL. SOVRASTRUTTURA
8 RELE' BOLLA



SICUREZZA
(Pl=c per 3 funzioni)

1 GESTIONE FUNGHI
2 MONITOR. STAB. (PIAZZATURA)
3 INTERBLOCCO POSTAZIONI COMANDO

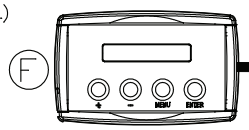


INPUTS:
1 STAB. AD GEOMETRIA
2 STAB. PD GEOMETRIA
3 STAB. AS GEOMETRIA
4 STAB. PS GEOMETRIA
5 STAB. AD TERRA
6 STAB. PD TERRA
7 STAB. AS TERRA
8 STAB. PS TERRA
9 MCS5
10 MCS6
11 SEL. PULS. CARRO
12 SEL. PIATTAFORMA
13 SERIE FUNGHI 1
14 SERIE FUNGHI 2

OUTPUTS:
1 EVP29-HS
2 EVP29-LS
3 EVP25-HS
4 EVP25-LS
5 CATENA FUNGHI 1
6 CATENA FUNGHI 2

POWER SUPPLY FOR OUTPUTS:
1 CELLA (Pl =d) per EVP29
2 MCS5,MCS6 (Pl =d) per EVS25

PULSANTIERA CALIBRAZIONE
P/N 23.0805.0XX/00
(OPTIONAL)



AT04-4P AT06-4S

CAN BUS

N

P/N 41.0601.054

R	CABLAGGIO 7 FILI PER JLP 80% L=60cm	6	13.0310.886
Q	JOYSTICK JLP 80%	6	20.0102.101
P	KIT CONNETTORE AT06-12S	1	13.0310.708
N	KIT CONNETTORE AT06-4S	4	13.0310.705
M	CELLA DI CARICO RIDONDANTE	1	FORNITURA CTE
L	CENTRALINA CAN CON AMPLIFICATORE CELLA RIDONDANTE	1	23.0406.021/00
I	INCLINOMETRO MONOASSE ±180°	2	20.0401.039/00
H	SENSORE ANALOGICO DI SFILO RIDONDANTE	1	21.0809.023/00
G	CONNETTORE SIGMA 24P CON FILI L=80cm	12	13.0310.236
F	PULSANTIERA CALIBRAZIONE CAN	1	23.0805.0XX/00
E	EC-MMS-2218 CARRO	1	24.0705.XXX/00
D	EC-MMS-TORRETTA PL	2	24.0705.XXX/00
C	EC-MMS-2218 PCARRO	1	24.0705.XXX/00
B	EC-MMS-SAFETY	1	24.0705.XXX/00
A	EC-MMS-2218 CESTO	1	24.0705.XXX/00
POS	DESCRIPTION	Q.TY	CODE

DENOMINAZIONE: SISTEMA DI CONTROLLO S3 PER PIATTAFORMA CON PANTOGRAFO SENZA JIB
ZED 20

SOSTITUISCE il N°

AGGIORNATO IL: 22/07/15

G F E D C B A

TECNORD
SERVOCOMANDI E REGOLAZIONE

SCALA / | DATA 22.05.15 | Foglio 1 di 1

COMMESSA	CLIENTE	COMPLESSIVO	N° ARCHIVIO	DIS.	CONTR.	APPROV.
	DECASYSTEM	SF.1804.005		PM	GR	PM

DISEGNO N° SF.1804.DEC.005

QUOTE SENZA TOLLERANZA: da 1 a 80: ±0,1 | da 80 a 200: ±0,15 | da 200 a 300: ±0,2 | da 300 a 600: ±0,3