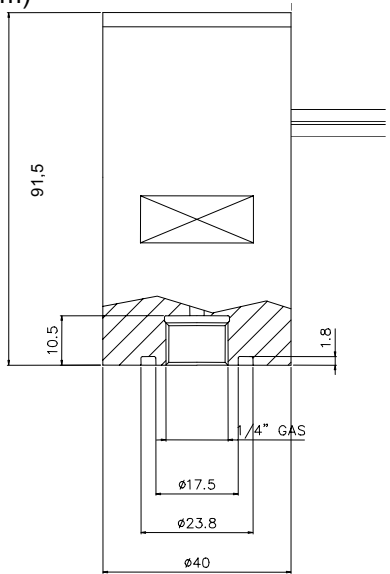


# DENSITY SWITCH



Dimensions (mm)



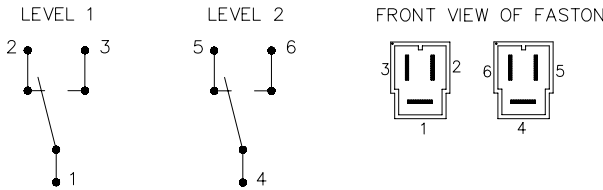
Security actuator for checking of fluid density. Normally used as density controller on SF6 Medium Voltage Switchboards.

**CONSTRUCTION DETAILS**

The multiple-bellows system permits wide movement without going beyond the elastic limit; this results in insensitivity to overpressure transients and thus repeatability of the pre-set density thresholds. All moving parts are enclosed in a dustproof housing, minimizing the risks of failure. An automatic cut-off valve, made to the same dimensions as the density switch, makes it possible to install and remove density switches without contacting and leaking the fluid being monitored. The same valve also allows the container being monitored to be filled or emptied, without the need of other devices and openings. The terminals are connected by faston or pre-set cables.

## GMD2/LT

- Two points density controller (temperature compensated for SF6-gas by a density of +20 °C)
- Any mounting position
- Compact design
- Factory calibration
- Faston 6,3 x 0,8
- Gas in contact with stainless steel
- Automatic cut-off valve (patented)
- Wiring diagram without gas



## Mechanical and physical characteristics

Calibration range (20 °C)..... 102 - 200 kPa  
 Maximum pressure transient amplitude .....500 kPa\*  
 Mechanical protection of active components.....IP 54  
 Operating temperature range..... -40° + 85° C\*  
 Maximum leakage rate.....1 x 10<sup>-9</sup> mbar lt/sec  
 Switching level tolerance...< ±2% of calibration value \*  
 Switching differential.....< 5 kPa  
 \*Versions with customized features can be provided

## Microswitch characteristics

Minimum time to failure of microswitch .....10 MIO  
 Switching capability .....2 A 250 V AC

Voltage,V	Inductive load	Resistive load
125 AC	2 A	2 A
250 AC	2 A	2 A
30 DC	2 A	2 A
125 DC	0,05 A	0,4 A

Approvals: CSA, SEMKO,UL, VDE

## Electrical insulation characteristics

Isolation level to ground.....2 kV 50 Hz x 1'  
 Isolation level between contacts.....1 kV 50 Hz x 1'

Ci riserviamo tutti i diritti connessi con il presente documento e con l'oggetto o la materia ivi rappresentati con divieto di riprodurlo, utilizzarlo o renderlo accessibile a terzi in assenza di previa autorizzazione

We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden

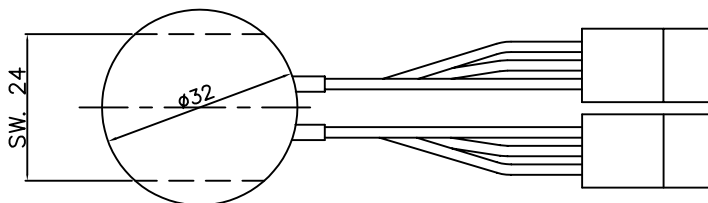
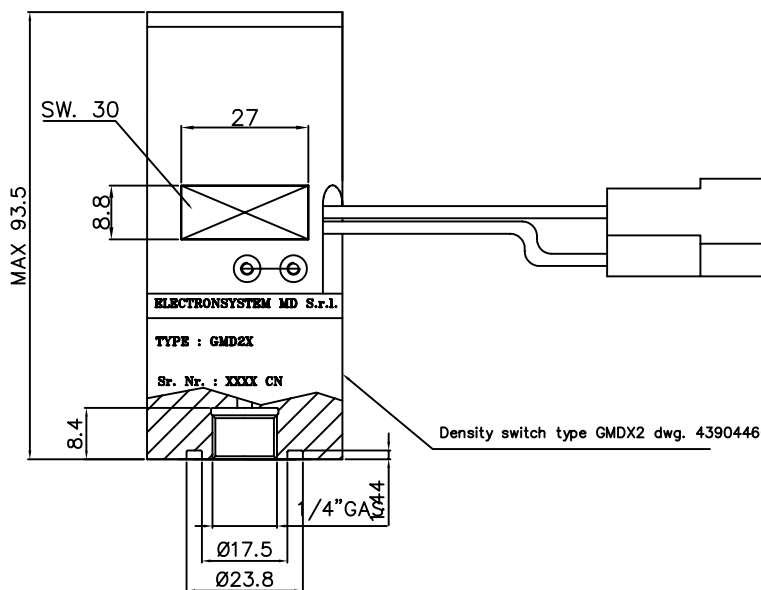


Fig.	Material/Materiale	N° COMMESSA	Finishing / Finitura						
Filing Room Archivio	Thread quality tolerance Tolleranza filetti qualita' "6g-6S" UNI 5541-65	General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:							
Prep. Dis. M.BOSISIO	Coord.Punching N.C. mach. Coord. punzon. a C.N. JS11	Quality for linear dimension Qualita' per quote lineari	<table border="1"> <tr> <td>Extra fine / Fine</td> <td>JS12</td> </tr> <tr> <td>Median / Media</td> <td>JS13</td> </tr> <tr> <td>Coarse / Grossolano</td> <td>JS15</td> </tr> </table>	Extra fine / Fine	JS12	Median / Media	JS13	Coarse / Grossolano	JS15
Extra fine / Fine	JS12								
Median / Media	JS13								
Coarse / Grossolano	JS15								
App. App. P.CIBOLDI	Resp. Dep. Uff. Tecnico	Title Titolo DENSITY SWITCH "GMD2X"							
Rev./Mod 0	14.04.2003 : Emissione nuovo disegno	Apparatus Apparecchio	Scale Scala 1:1						
<b>ELECTRONSYSTEM MD S.r.l.</b>		Doc. No. N° Doc. 43904460	Sh. No. Pag. 1/2						

Ci riserviamo tutti i diritti connessi con il presente documento e con l'oggetto o la materia ivi rappresentati con divieto di riprodurlo, utilizzarlo o renderlo accessibile a terzi in assenza di previa autorizzazione

We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden

TECHNICAL FEATURES

1 MECHANICAL DATA

- 1.1 DENSITY SWITCH COMPATIBLE WITH SF6
- 1.2 CASE MATERIAL: ANODIZED ALUMINIUM
- 1.3 THREAD CONNECTION : SEE TABLE 43904460/T
- 1.4 PROTECTION >IP54
- 1.5 OPERATING TEMPERATURE: -25...+60°C ( -40°C +85°C for /LT version)
- 1.6 LEAKAGE RATE <math>1 \times 10^{-9}</math> MBARxL/SEC
- 1.7 PRESSURE RANGE : 1-7 BAR ABS.
- 1.8 MAX PRESSURE ADMISSIBLE (PEAK 100 MSEC) :
  - 3 BAR ABS. WITH: LEVEL MAX < 1.5 BAR ABS.
  - 10 BAR ABS WITH: 1.5 BAR ABS.< LEVEL MAX < 7 BAR ABS.

1.9 BURSTING PRESSURE : >30 BAR

1.10 VALUE OF SETTING LEVEL 1 AT 20°C : SEE TABLE 43904460/T

1.11 VALUE OF SETTING LEVEL 2 AT 20°C : SEE TABLE 43904460/T

1.12 TOLERANCE AT 20°C : SEE TABLE 43904460/T

1.12 MAX ERROR OF COMPENSATION AT LIMIT TEMPERATURE:

- ±0.05 BAR REL. WITH: LEVEL MAX < 1.5 BAR ABS.
- ±0.1 BAR REL. WITH: 1.5 BAR ABS.< LEVEL MAX < 7 BAR ABS.

2 ELECTRICAL DATA

2.1 TYPE OF CONTACT: MICRO SWITCH

2.2 CONTACT MATERIAL: PURE SILVER

2.3 INSULATION LEVEL BETWEEN CONTACTS N.O.:

\_1 KV x 50 Hz x 1'

\_2 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)

2.4 INSULATING LEVEL BETWEEN CONTACTS AND CASE:

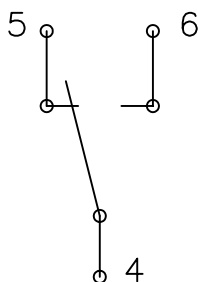
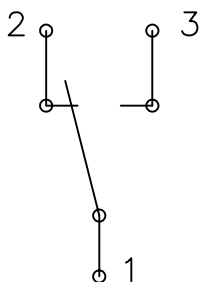
\_2 KV x 50 Hz x 1'

\_5 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)

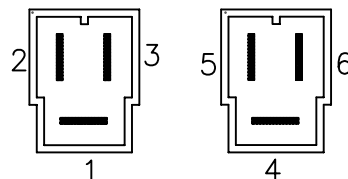
2.5 SWITCHING CAPABILITY: 5A 220V AC

LEVEL 1

LEVEL 2



FRONT VIEW OF FASTON



WIRING DIAGRAM WITHOUT GAS

Fig.	Material/Materiale	N° COMMESSA	Finishing / Finitura						
Filing Room Archivio	Thread quality tolerance Tolleranza filetti qualita' "6g-6S" UNI 5541-65	General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:							
		Coord.Punching N.C. mach. Coord. punzon. a C.N. JS11	Quality for linear dimension Qualita' per quote lineari						
			<table border="1"> <tr> <td>Extra-fine / Fine</td> <td>JS12</td> </tr> <tr> <td>Median / Media</td> <td>JS13</td> </tr> <tr> <td>Coarse / Grossolana</td> <td>JS15</td> </tr> </table>	Extra-fine / Fine	JS12	Median / Media	JS13	Coarse / Grossolana	JS15
Extra-fine / Fine	JS12								
Median / Media	JS13								
Coarse / Grossolana	JS15								
Prep. Dis. M.BOSISIO	Resp. Dep. Uff. Tecnico	Title Titolo	DENSITY SWITCH "GMD2X" technical features						
App. App. P.CIBOLDI									
Rev./Mod	0 14.04.2003 : Emissione nuovo disegno	Apparatus Apparecchio	Scale Scala 1:1						
<b>ELECTRONSYSTEM MD S.r.l.</b>		Doc. No. N° Doc.	43904460						
			Sh.No. N° Pag. 2/2						

CODE_EL/MD	Setting L1	Tolerance	Setting L2	Tolerance	Reset	Gas connection	Operative temp.	O-ring material	Drawing n°	Customer code
GMD205	1.1bar abs.	±0.03	1.3bar abs.	±0.03	<0.1	1/4"G female	-25C +85C	NBR70	43904460	
GMD205/LT	1.1bar abs.	±0.03	1.3bar abs.	±0.03	<0.1	1/4"G male	-40C +85C	EPDM70	43904460	
GMD206	1.05bar abs.	±0.03	1.2bar abs.	±0.03	<0.1	1/4"G female	-25C +85C	NBR70	43904460	
GMD207*	4.8bar abs.	±0.25	4.5bar abs.	±0.25	<0.3	1/4"G female	-25C +85C	NBR70	43904460	
GMD207/LT*	4.8bar abs.	±0.25	4.5bar abs.	±0.25	<0.3	1/4"G female	-40C +85C	EPDM70	43904460	
GMD208*	3.8bar abs.	±0.25	3.5bar abs.	±0.25	<0.3	1/4"G female	-25C +85C	NBR70	43904460	
GMD208/LT*	3.8bar abs.	±0.25	3.5bar abs.	±0.25	<0.3	1/4"G female	-40C +85C	EPDM70	43904460	
GMD209	0.06 bar	±0.03	0.06 bar	±0.03	<0.1	1/4"G male	-40C +85C	NBR70	43904460	
GMD209/LT	0.06 bar	±0.03	0.06 bar	±0.03	<0.1	1/4"G male	-25C +85C	EPDM70	43904460	
GMD210**	0.10 bar	±0.03	0.06 bar	±0.03	<0.1	1/4"G male	-25C +85C	NBR70	43904460	12264282
GMD210/LT**	0.10 bar	±0.03	0.06 bar	±0.03	<0.3	1/4"G male	-25C +85C	NBR70	43904460	12264282
GMD211*	3.1 bar abs.	±0.25	2.8 bar abs.	±0.25	<0.3	1/4"G female	-40C +85C	NBR70	43904460	
GMD211/LT*	3.1 bar abs.	±0.25	2.8 bar abs.	±0.25	<0.3	1/4"G female	-40C +85C	EPDM70	43904460	
GMD212	0.1 bar	±0.03	0.1 bar	±0.03	<0.3	1/4"G female	-25C +85C	NBR70	43904460	
GMD213	105kPa	±4	105kPa	±4	<30	1/4"G female	-25C +85C	NBR70	43904460	Covetti da 900mm spaldati
GMD214	1.1 bar abs	±0.05	1.3 bar abs	±0.05	<0.1	1/4"G male	-25C +85C	NBR70	43904466	AGS000723-01
GMD215	3.1 bar	±0.06	3.1 bar	±0.06	<0.3	1/4"G male	-25C +85C	NBR70	43904460	
GMD216	0.04 bar	±0.02	0.08 bar	±0.02	<0.1	1/4"G female	-25C +85C	EPDM70	43904485	
GMD217	1.1 bar abs	±0.05	1.3 bar abs	±0.05	<0.1	1/4"G male	-25C +85C	NBR70	43904472	
GMD218	1.25 bar abs	±0.05	1.45 bar abs	±0.05	<0.1	CUSTOMER	-25C +85C	EPDM70	43904499	
GMD219	3.1 bar	±0.08	3.3 bar	±0.08	<0.3	1/4"G male	-25C +85C	EPDM70	43904650	
GMD220	0.10 bar	±0.03	0.06 bar	±0.03	<0.1	1/4"G female	-25C +85C	NBR70	43904460	
GMD221	1.15 bar abs.	±0.05	1.08 bar	±0.05	<0.1	1/4"G male	-40C +85C	EPDM70	43904650	
GMD222	0.95 bar abs.	±0.05	0.88 bar abs.	±0.05	<0.1	1/4"G male	-40C +85C	EPDM70	43904460	
GMD223**	0.15 bar	±0.05	0.25 bar	±0.05	<0.1	1/4"G male	-40C +85C	EPDM70	43904485	
GMD224	0.09 bar	±0.02	0.14 bar	±0.02	<0.1	CUSTOMER	-25C +85C	NBR70	43904720	
GMD225	1.35 bar abs.	±0.05	1.25 bar abs	±0.05	<0.1	CUSTOMER	-25C +85C	NBR70	43904477	AGS00723-98
GMD226	0.11 MPa	±0.003	0.13 MPa	±0.003	<0.1	CUSTOMER	-40C +85C	EPDM70	43904466	AGS002908-01
GMD227	0.125 MPa	±0.003	0.145 MPa	±0.003	<0.1	CUSTOMER	-25C +85C	NBR70	43904466	AGS002908-02
GMD228	0.11 MPa	±0.003	0.115 MPa	±0.003	<0.1	CUSTOMER	-25C +85C	NBR70	43904466	AGS002908-03
GMD229	1.35 bar abs	±0.05	1.30 bar abs.	±0.05	<0.1	CUSTOMER	-25C +85C	NBR70	43904466	AGS00723-97
GMD230	0.04 bar	±0.05	0.08 bar	±0.05	<0.1	CUSTOMER	-25C +85C	NBR70	43908090	

VALUE SETTING AT 20°C  
 \* Switching difference: L1 - L2 > 0.15 bar  
 \*\* Switching difference L1-L2 > 0.03 bar  
 /V : version with valve

Piano di Compiamento (UNI ISO 2859)		Visto U.A./U.V.:		Data:	
LIVELLO	LQA				
L2	1	Ci riserviamo tutti i diritti connessi con il presente documento e con l'oggetto o la materia ivi rappresentati con divieto di riproduzione, utilizzo o renderlo accessibile o terzi in assenza di previo autorizzazione.			

Fig.	Material/Materiale		N° Series / Serie	Finishing / Finitura
Filing Room Archivio	Thread quality tolerance Tolleranza filetti qualità "6g-6S" UNI 5541-65	General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:		JS12
Prep. M. BOSISIO	Coord.Punching N.C. mach. Coord. punzon. a C.N. JS11	Qualità for linear dimension Qualità per quote lineari	JS13	JS15
App. P. CIBOLDI	Resp. Dep. Uff. Tecnico	TABELLA CODICI GMD2		
Rev./Mod.	0	15.01.2004 : Emissione nuovo disegno	Apparatus Apparecchio	Scala 1:1
ELECTRONSYSTEM MD S.r.l.		Doc. No. 43904460/T		
		Rip. No. 1/1		



Ci riserviamo tutti i diritti connessi con il presente documento e con l'oggetto o la materia ivi rappresentati con divieto di riprodurlo, utilizzarlo o renderlo accessibile a terzi in assenza di previa autorizzazione

We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden

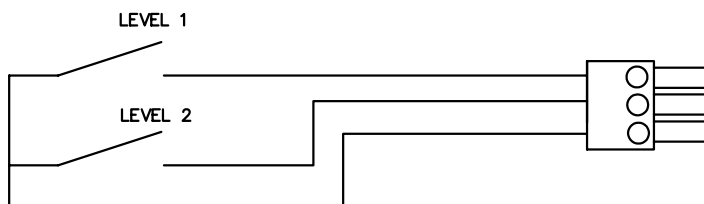
TECHNICAL FEATURES

1 MECHANICAL DATA

- 1.1 DENSITY SWITCH COMPATIBLE WITH SF6
- 1.2 CASE MATERIAL: ANODIZED ALUMINIUM
- 1.3 THREAD CONNECTION : ALUMINIUM
- 1.4 PROTECTION >IP54
- 1.5 OPERATING TEMPERATURE: -25...+60°C ( -40°C +85°C for /LT version)
- 1.6 LEAKAGE RATE <1x10<sup>-9</sup> MBARxL/SEC
- 1.7 PRESSURE RANGE : 1-7 BAR ABS.
- 1.8 MAX PRESSURE ADMISSIBLE (PEAK 100 MSEC) :
  - 3 BAR ABS. WITH: LEVEL MAX < 1.5 BAR ABS.
  - 10 BAR ABS WITH: 1.5 BAR ABS.< LEVEL MAX < 7 BAR ABS.
- 1.9 BURSTING PRESSURE : >30 BAR
- 1.10 VALUE OF SETTING LEVEL 1 AT 20°C : 1,1 bar abs.
- 1.11 VALUE OF SETTING LEVEL 2 AT 20°C : 1,3 bar abs.
- 1.12 TOLERANCE AT 20°C : ± 0.05 bar
- 1.13 MAX ERROR OF COMPENSATION AT LIMIT TEMPERATURE:
  - ±0.05 BAR REL. WITH: LEVEL MAX < 1.5 BAR ABS.

2 ELECTRICAL DATA

- 2.1 TYPE OF CONTACT: MICRO SWITCH
- 2.2 CONTACT MATERIAL: PURE SILVER
- 2.3 INSULATION LEVEL BETWEEN CONTACTS N.O.:
  - \_1 KV x 50 Hz x 1'
  - \_2 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)
- 2.4 INSULATING LEVEL BETWEEN CONTACTS AND CASE:
  - \_2 KV x 50 Hz x 1'
  - \_5 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)
- 2.5 SWITCHING CAPABILITY: 5A 220V AC (2A 220V AC for /LT version)



WIRING DIAGRAM WITHOUT GAS

Fig.	Material/Materiale	N° COMMESSA	Finishing / Finitura						
Filing Room Archivio	Thread quality tolerance Tolleranza filetti qualita' "6g-6S" UNI 5541-65	General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:							
	Coord.Punching N.C. mach. Coord. punzon. a C.N. JS11	Quality for linear dimension Qualita' per quote lineari	<table border="1"> <tr> <td>Extra fine / Fine</td> <td>JS12</td> </tr> <tr> <td>Median / Media</td> <td>JS13</td> </tr> <tr> <td>Coarse / Grossolana</td> <td>JS15</td> </tr> </table>	Extra fine / Fine	JS12	Median / Media	JS13	Coarse / Grossolana	JS15
Extra fine / Fine	JS12								
Median / Media	JS13								
Coarse / Grossolana	JS15								
Prep. Dis. M.BOSISIO	Resp. Dep. Uff. Tecnico	Title Titolo DENSITY SWITCH "GMD214" technical features							
App. App. P.CIBOLDI			Lang. Lingua						
Rev./Mod	0 04.07.2006 : Emissione nuovo disegno	Apparatus Apparecchio	Scale Scala 1:1						
<b>ELECTRONSYSTEM MD S.r.l.</b>		Doc. No. N° Doc. 43904466	Sh.No. Pag. 2/2						

Data: 26.06.2006  
 Rev./Mod: A  
 Descrizione: ELIMINATA VALVOLA  
 Data: 04.07.2006  
 Rev./Mod: B  
 Descrizione: modificata morsetteria  
 Data: 21/08/2007  
 Rev./Mod: C  
 Descrizione: AGGIUNTE NOTE MORSETTIERA  
 Data: 04.07.2006  
 Rev./Mod: 0  
 Descrizione: Emissione nuovo disegno



Ci riserviamo tutti i diritti connessi con il presente documento e con l'oggetto o la materia ivi rappresentati con divieto di riprodurlo, utilizzarlo o renderlo accessibile a terzi in assenza di previa autorizzazione

We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden

TECHNICAL FEATURES

1 MECHANICAL DATA

- 1.1 DENSITY SWITCH COMPATIBLE WITH SF6
- 1.2 CASE MATERIAL: ANODIZED ALUMINIUM
- 1.4 PROTECTION >IP54
- 1.5 OPERATING TEMPERATURE: -25...+60°C
- 1.6 LEAKAGE RATE <math>1 \times 10^{-9}</math> MBARxL/SEC
- 1.7 PRESSURE RANGE : 1-7 BAR ABS.
- 1.8 MAX PRESSURE ADMISSIBLE (PEAK 100 MSEC) : 3 BAR ABS.

1.9 BURSTING PRESSURE : >30 BAR

1.10 VALUE OF SETTING LEVEL 1 AT 20°C : 1.1 BAR ABS

1.11 VALUE OF SETTING LEVEL 2 AT 20°C : 1.3 BAR ABS.

1.12 TOLERANCE AT 20°C : ±0.05 bar rel.

1.13 MAX ERROR OF COMPENSATION AT LIMIT TEMPERATURE: ±0.05 BAR REL.

2 ELECTRICAL DATA

2.1 TYPE OF CONTACT: MICRO SWITCH

2.2 CONTACT MATERIAL: PURE SILVER

2.3 INSULATION LEVEL BETWEEN CONTACTS N.O.:

\_1 KV x 50 Hz x 1'

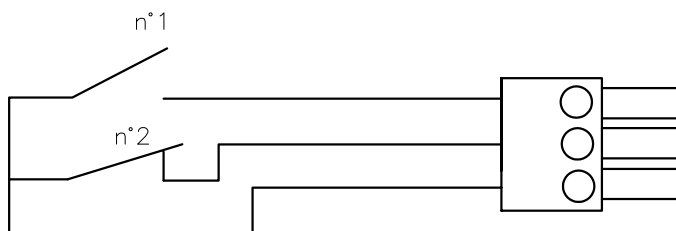
\_2 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)

2.4 INSULATING LEVEL BETWEEN CONTACTS AND CASE:

\_2 KV x 50 Hz x 1'

\_5 KV AT IMPULSE VOLTAGE TEST (1.2/50ms)

2.5 SWITCHING CAPABILITY: 5A 220V AC (2A 220V AC for /LT version)



CONTACT N°1 OPENED WITH FALLING SF6 DENSITY

CONTACT N°2 CLOSED WITH FALLING SF6 DENSITY

Fig.	Material/Materiale	N° COMMESSA	Finishing / Finitura						
Filing Room Archivio	Thread quality tolerance Tolleranza filetti qualita' "6g-6S" UNI 5541-65	General tolerance for machining / Tolleranze generali per lavorazioni meccaniche:							
	Coord.Punching N.C. mach. Coord. punzon. a C.N. JS11	Quality for linear dimension Qualita' per quote lineari	<table border="1"> <tr> <td>Extra fine / Fine</td> <td>JS12</td> </tr> <tr> <td>Median / Media</td> <td>JS13</td> </tr> <tr> <td>Coarse / Grossolana</td> <td>JS15</td> </tr> </table>	Extra fine / Fine	JS12	Median / Media	JS13	Coarse / Grossolana	JS15
Extra fine / Fine	JS12								
Median / Media	JS13								
Coarse / Grossolana	JS15								
Prep. Dis. M.BOSISIO	Resp. Dep. Uff. Resp. Uff. Tecnico	Title Titolo DENSITY SWITCH "GMD217" technical features							
App. App. P.CIBOLDI			Lang. Lingua						
Rev./Mod	0 12.07.2007 : Emissione nuovo disegno	Apparatus Apparecchio	Scale Scala 1:1						
<b>ELECTRONSYSTEM MD S.r.l.</b>		Doc. No. N° Doc. 43904472	Sh.No. N° Pag. 2/2						

Data

Rev./Mod  
Descrizione:

Data

Rev./Mod  
Descrizione:

Data

Rev./Mod  
Descrizione:

Data

Rev./Mod  
Descrizione:

Data

Rev./Mod  
Descrizione:

Data : 18/07/07  
Descrizione: MODIFICATI LIVELLI  
Rev./Mod : A

