

Special-Sensors for Automation



Temperature Sensors

- Monitor temperatures in the best possible manner
- Compact model
- Temperature sensors with threaded sleeve
- Programmable, switching points, analog output



**ISO 9001
certified**

Technology and application

Functionality

The compact models TN 552 GPP and TN 552/1 GPP have two independent adjustable switching points. The compact models TN 552 GAPP and TN 552/1 GAPP have one independent adjustable switching point and one scalable 4...20 mA analog output.

The detecting range for fluids is from -40 °C to $+120\text{ °C}$, the tolerance is 0.3 °C ($0\text{...}80\text{ °C}$).

The compact models TN 552... offer a window function as an alternative to the standard limit monitoring. Additionally, the NO/NC output function is programmable. Transient temperature changes can be bridged with a switch-on / switch-off time delay.

The push-buttons on the front of the sensor are used for programming the sensor functions. The programmed switching point and parameters are displayed and set by keyboard request. This function is possible while the sensor is measuring.

Temperature sensor with threaded sleeve allowing for exchange during ongoing operations

The temperature sensor TN 553 can easily be exchanged during ongoing operations. This is made possible through the use of a special stainless steel (AISI 316 Ti) threaded sleeve that is mounted in the tank or pipe. In this way the compact device can at any time be removed without compromising the seal of the tank or pipe. The temperature sensor measures temperatures from -40 °C to $+120\text{ °C}$ and offers, among other features, two programmable switching points, freely selectable hysteresis and a temperature window function. The device is available as a 24 V DC device with PNP or analog output as well as a 230 V and 115 V AC model with Opto-MOS. Various cable lengths and optional plug-in or hardwire connections allow the device to be installed in various configurations. The thread is a G1/2 gauge.

Installation

EGE temperature sensors can be installed in standard T-pieces or welded T-pieces. The packing is made with an additional flat seal or with other suitable materials. Please note the temperature and pressure resistance of the seals for increased process conditions. Fixing the sensor in the T-pieces is only allowed on the screw head of the sensor. After the installation the display can be turned through an angle of 330 ° for best reading. In applications with temperature over $+80\text{ °C}$ the sensor should be mounted from the side into the pipe.

Application

The hysteresis function is for controlling a temperature value. A limiting value can be programmed in this mode. As soon as the measured temperature is higher than the programmed limiting value, the output signals are switched as programmed (NC or NO). The hysteresis value is the difference temperature for the switch-on and switch-off signal of the limiting value. An additional time delay for the switching signals can be programmed for each switching point.

In the frame function mode the switching function is set depending of a programmed temperature range. The temperature range starts with the programmed lower value and end with programmed upper frame value.

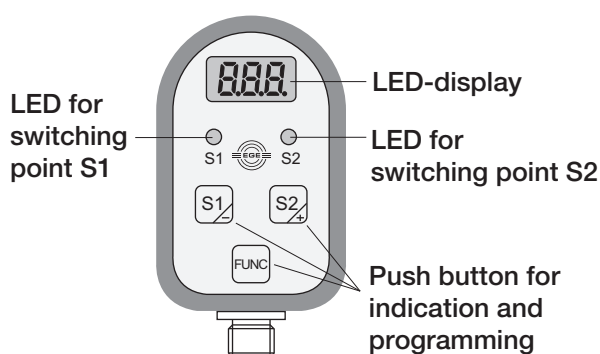
The time delay for the switching signal can also be used in this switching mode.

The analog output can be use for transmitting the temperature and getting the proportional current. For that you assign one temperature for the 4 mA first-value and one temperature for the 20 mA last-value in the programming mode. Between the temperature values it is permissible to have a minimal difference of 16 °C .

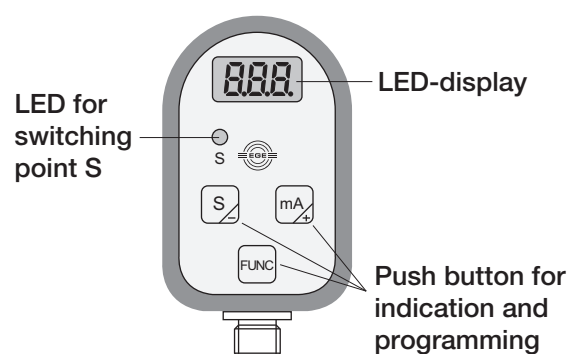
Color code:

BK = black BN = brown BU = blue WH = white

TN 552... GPP
TN 553... GPP/WP



TN 552... GAPP
TN 553... GAPP



Technology and application

Monitor temperatures in the best possible manner

EGE features standard measuring elements for temperature in a robust and easy-to-install design which is best suitable for the respective industrial application or automation task - available for ATEX Zone 22 or with GL certificates as well.

Examples are the TGM 025-03 for monitoring of hot gases up to 1000 °C (available with evaluation unit as an option) or the TGM 050-TS for monitoring of threshold temperatures for overheat protection.

Our temperature sensors TGB in standard enclosures with resistance- or analog signal exit complement our range of products.

Compact temperature sensors with integrated evaluation electronics Series TGBA

The temperature sensor TGBA 050 GI with a type B connection head according to DIN 43729 cover a -50...+400 °C temperature range and transmit measured data via an analog 4...20 mA output. Sensors are as well available with resistance output. The accuracy is ±1%. Available with lengths of 50, 100, 200 or 400 mm, the device are mounted via a G1/2 thread. The aluminium connection head, which is suitable for temperatures between -25 and 70 °C, reaches protection ratings of IP 54 on the connection side and IP 68 on the sensor side. TGBA sensors are pressure-proof up to 40 bar. If requires, EGE also provides customized sensors models.

Monitoring of temperature thresholds under extreme environmental conditions Series TGM...-TS

The TGM 050-TS series of temperature sensors provides a robust solution for the monitoring of temperature thresholds. Designed for a temperature range between +60 and +100 °C, TGM 05 sensors open a contact if a pre-set temperature is exceeded. The threshold is set by the manufacturer in 5 °C increments according to customer specifications. Thanks to IP68 / IP69K protection on the medium side and a stainless steel housing, the sensors provide excellent media resistance. Additionally, they withstand pressures up to 30 bar. They are installed by means of a G1/2 thread and are suitable for switching voltages up to 230 V AC.

Reliable temperature monitoring: Sensors for hot gases up to 1000 °C Series TGM...-03

Suitable for media temperatures between -50 and +1000 °C, the stainless steel temperature sensor TGM 025-03 is designed to monitor hot gases. The very compact unit is integrated by means of a G1/4 thread and uses a type K thermocouple to register temperatures. The TGM 025-03 sensor can be connected to any standard amplifier for type K thermocouples.



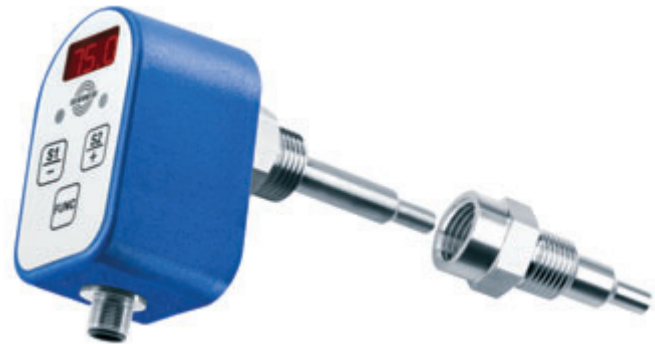
Two switching points and analog output

Series TN 553

Exchangeable during ongoing operations through use of threaded sleeve

Measuring range $-40...+120\text{ }^{\circ}\text{C}$

Hysteresis and temperature window easily programmable



Design	DC • G1/2		AC • G1/2
Dimensions			
Detection range [°C]	-40...+120		
Output	2x PNP NC/NO	+ 4...20 mA	2x NC/NO, progr.
ID-No.	P71021	P71022	P71023
Type	TN 553/1 GPP	TN 553/1 GAPP	TN 553/1 WP
Supply voltage [V]	24 DC $\pm 10\%$	24 DC $\pm 10\%$	230 AC $\pm 10\%$
Current consumption [mA]	60	60	20
Voltage drop [V]	<2.5	<2.5	<10
Ambient temperature [°C]	-20...+60		
Medium temperature [°C]	-40...+120		
Response time [s]	typ. 10...30		
Resolution display [°C]	0.1		
Range limit values [°C]	-39...+120 (0.5 / 1 Step)		
Range hysteresis [°C]	0.5...99 (0.5 / 1 Step)		
Range window [°C]	0.5...99 (0.5 / 1 Step)		
Time delay [s]	0...50 (0.5 / 1 Step)		
Programmable functions	two switching points, hysteresis/window, switching output NC/NO, MIN-/MAX- memory function		
Compressive strength [bar]	20		
Housing material	housing: PBT sensor and sleeve: AISI 316 Ti		
Protection [EN 60529]	IP 65		
Connection	M12 connector	1/2"-20UNF, 5-pol.	
Accessories	2x flat gasket, threaded sleeve, heat conducting paste		

Two switching points

Series TN 552

Measuring range

-40 °C...+120 °C / -40 °F...+248 °F

Two switching points, hysteresis and temperature window easily programmable

Rotable display

Switch-over °C - °F



Design	DC • G1/2 • L= 31 mm	DC • G1/2 • L= 48 mm
Dimensions		
Detection range	-40...+120 °C (-40...+248 °F)	
Output	2x PNP NC/NO	
ID-No.	P71017	P71018
Type	TN 552 GPP	TN 552/1 GPP
Supply voltage [V]	24 DC ±10%	
Current consumption [mA]	<100	
Voltage drop [V]	<2.5	
Switching current [mA]	200	
Ambient temperature [°C]	-20...+60	
Medium temperature [°C]	-40...+120	
Response time [s]	typ. 10	
Resolution display [°C/°F]	0.1 / 0.5	
Range limit values [°C/°F]	-39...+120 / -39...248	(0.5 / 1 Step)
Range hysteresis [°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Range window [°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Time delay [s]	0...50	(0.5 / 1 Step)
Programmable functions	two switching points, hysteresis/window, switching output NC/NO, MIN-/MAX- memory function	
Compressive strength [bar]	100	
Housing material	housing: PBT sensor: AISI 316 Ti	
Protection [EN 60529]	IP 65	
Connection	M12 connector	
Accessories	see page 7.06	

Switching point and analog output

Series TN 552

Measuring range

-40 °C...+120 °C / -40 °F...+248 °F

Switching point and analog output, hysteresis and temperature window easily programmable

Rotable display

Switch-over °C - °F



Design	DC • G1/2 • L= 31 mm	DC • G1/2 • L= 48 mm
Dimensions		
Detection range	-40...+120 °C (-40...+248 °F)	
Output		
ID-No.	P71019	P71020
Type	TN 552 GAPP	TN 552/1 GAPP
Supply voltage [V]	24 DC ±10%	
Current consumption [mA]	<200	
Voltage drop [V]	<2.5	
Analog output [mA]	4...20, scalable, Detection range min. 16 °C / 29 °F	
Switching current [mA]	200	
Ambient temperature [°C]	-20...+60	
Medium temperature [°C]	-40...+120	
Response time [s]	typ. 10	
Resolution display [°C/°F]	0.1 / 0.5	
Range limit values [°C/°F]	-39...+120 / -39...248	(0.5 / 1 Step)
Range hysteresis [°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Range window [°C/°F]	0.5...99 / 1...179	(0.5 / 1 Step)
Time delay [s]	0...50	(0.5 / 1 Step)
Programmable functions	one switching point, hysteresis/window, switching output NC/NO, MIN- / MAX- memory function	
Compressive strength [bar]	100	
Housing material	housing: PBT sensor: AISI 316 Ti	
Protection [EN 60529]	IP 65	
Connection	M12 connector	
Accessories	see page 7.06	

Temperature Sensors



Compact model with analog output

Series TGBA

Analog output

Up to 400 °C

Temperature range according to customer specification

As well available with resistance output



Design	G1/2											
Dimensions												
Supply voltage [V]	12...30 DC											
ID-No.	P.....											
Type-sensor length L [mm]	TGBA 050 GI-Lxxx											
Temperature range medium [°C]	min. -50...+375 max. -25...+400 Δ between min. and max. has to be minimum 25 °C											
Ambient temperature [°C]	-25...+70											
Output [mA]	4...20											
Turn on delay [s]	approx. 4 (output < 4 mA)											
Protection [EN 60529]	housing: IP 67 / sensor tip: IP 68 / IP 69K											
Housing material	Aluminium, form B terminal head											
Material sensor probe	AISI 316 Ti											
Sealing material	NBR, AFM 34, different material on request											
Compressive strength [bar]	40 (25 °C)											
Diameter connecting cable	Ø 7 mm up to Ø 12 mm											
Connection	terminal screws, max. 1 mm ²											
		<p>Sensor length</p> <p>The total length L of the sensor is specified by appending "Lxxx" to the type.</p> <p>xxx: Length in mm</p> <table border="1"> <thead> <tr> <th>Preferred lengths</th> <th>ID-No.</th> </tr> </thead> <tbody> <tr> <td>50 mm: L050</td> <td>P71028</td> </tr> <tr> <td>100 mm: L100</td> <td>P71029</td> </tr> <tr> <td>200 mm: L200</td> <td>P71030</td> </tr> <tr> <td>400 mm: L400</td> <td>P71031</td> </tr> </tbody> </table>	Preferred lengths	ID-No.	50 mm: L050	P71028	100 mm: L100	P71029	200 mm: L200	P71030	400 mm: L400	P71031
Preferred lengths	ID-No.											
50 mm: L050	P71028											
100 mm: L100	P71029											
200 mm: L200	P71030											
400 mm: L400	P71031											

Compact switch

Series TGM

For the monitoring of temperature thresholds

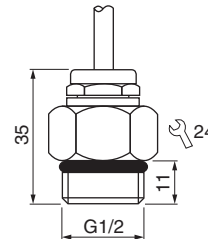
Sensor tip pressure resistant up to 30 bar


IP 68 / IP 69K

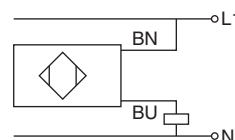


Design G1/2

Dimensions



Sensing temperature [°C]	+60 °C...100 °C (5 °C step)																					
Output																						
ID-No.	P.....	The temperature threshold of the sensor is specified by "TSxxx" in the type designation. xxx: °C <table border="1"> <thead> <tr> <th>Temperature threshold</th> <th>ID-No.</th> </tr> </thead> <tbody> <tr><td>60 °C:</td><td>TS060</td></tr> <tr><td>65 °C:</td><td>TS065</td></tr> <tr><td>70 °C:</td><td>TS070</td></tr> <tr><td>75 °C:</td><td>TS075</td></tr> <tr><td>80 °C:</td><td>TS080</td></tr> <tr><td>85 °C:</td><td>TS085</td></tr> <tr><td>90 °C:</td><td>TS090</td></tr> <tr><td>95 °C:</td><td>TS095</td></tr> <tr><td>100 °C:</td><td>TS100</td></tr> </tbody> </table>	Temperature threshold	ID-No.	60 °C:	TS060	65 °C:	TS065	70 °C:	TS070	75 °C:	TS075	80 °C:	TS080	85 °C:	TS085	90 °C:	TS090	95 °C:	TS095	100 °C:	TS100
Temperature threshold	ID-No.																					
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90 °C:	TS090																					
95 °C:	TS095																					
100 °C:	TS100																					
Type	TGM 050-TSxxx																					
Tolerance [K]	±5																					
Reset	30 ±15 K																					
temperature range [K]	below temperature threshold																					
Medium temperature [°C]	-10...+120																					
Temperature range cable [°C]	-10...+80																					
Switching voltage [V]	max. 230 AC																					
Switching current [A]	max. 2,5 cos φ = 1 max. 1,6 cos φ = 0,6																					
Protection [EN 60529]	IP 67																					
Housing	IP 68 / IP 69K																					
Sensor tip	AISI 316 Ti, Br-Ni																					
Housing material	30																					
Compressive strength [bar]	O-Ring, 16x2.5 NBR																					
Sealing	2 m PVC-cable 2x0.5 mm ²																					
Connection																						



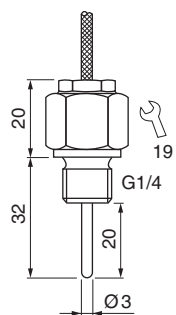
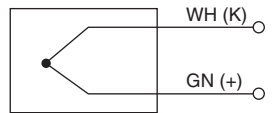
Probe

Series TGM

For hot gases
up to 1000 °C

Thermocouple type K

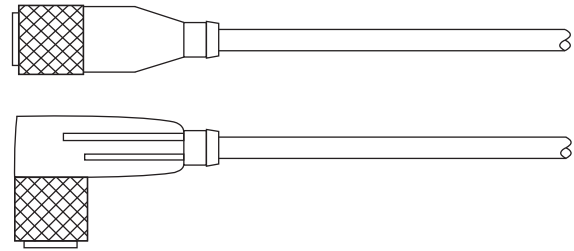


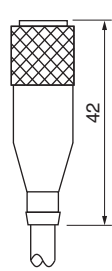
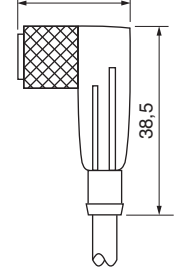
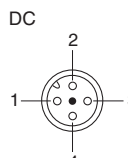
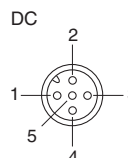
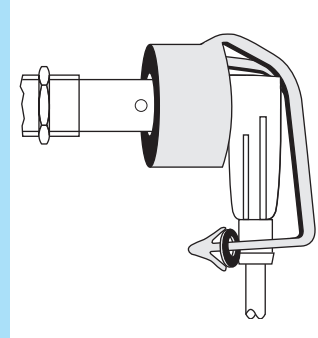
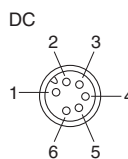
Design	G1/4
Dimensions	
Thermocouple	NiCr-Ni (type K)
ID-No.	P71032
Type [mm]	TGM 025-03
Medium temperature [°C]	-50...+1000
Ambient temperature [°C]	-25...+350
Housing material	AISI 316 Ti
Compressive strength [bar]	40 (25 °C)
Protection [EN 60529]	IP 60
Housing	IP 68 / IP 69K
Sensor tip	IP 68 / IP 69K
Connection	2 m NiCr-Ni connection cable with stainless steel braided hose
	

Accessories • M12 connector

System SL

Finished cable plug housing
Self locking screw plug
Protection IP 67



Cable plug housing		Pin-assignment		Plug-lock
<p>straight</p>  <p>42</p> <p>SLG...</p>	<p>angular</p>  <p>26,5</p> <p>38,5</p> <p>SLW...</p>	<p>DC</p>  <p>3-wire</p> <p>1: BN 2: - 3: BU 4: BK</p> <p>4-wire</p> <p>1: BN 2: WH 3: BU 4: BK</p>	<p>DC</p>  <p>5-wire</p> <p>1: BN 2: WH 3: BU 4: BK 5: GY</p>	 <p>PL-M12</p>
		<p>DC</p>  <p>6-wire</p> <p>1: BN 2: WH 3: BU 4: BK 5: GY 6: PK</p>		
		DC		

TYPE	ID-NO.	DESIGN
SLG 3-2	Z01076	Cable plug housing straight, 2 m cable 3x0.34 mm ² max. 250 V / 4 A
SLG 3-5	Z01077	Cable plug housing straight, 5 m cable 3x0.34 mm ² max. 250 V / 4 A
SLW 3-2	Z01078	Cable plug housing angular, 2 m cable 3x0.34 mm ² max. 250 V / 4 A
SLW 3-5	Z01079	Cable plug housing angular, 5 m cable 3x0.34 mm ² max. 250 V / 4 A
SLW 3-2-LED	Z00052	Cable plug housing angular, 2 m cable 3x0.34 mm ² max. 250 V / 4 A PNP with LED
SLG 4-2	Z00445	Cable plug housing straight, 2 m cable 4x0.25 mm ² max. 250 V / 4 A
SLG 4-5	Z00449	Cable plug housing straight, 5 m cable 4x0.25 mm ² max. 250 V / 4 A
SLW 4-2	Z00446	Cable plug housing angular, 2 m cable 4x0.25 mm ² max. 250 V / 4 A
SLW 4-5	Z00450	Cable plug housing angular, 5 m cable 4x0.25 mm ² max. 250 V / 4 A
SLW 4-2-LED	Z01157	Cable plug housing angular, 2 m cable 4x0.25 mm ² max. 250 V / 4 A PNP with LED
SLG 5-2	Z01150	Cable plug housing straight, 2 m cable 5x0.34 mm ² max. 60 V / 2 A
SLW 5-2	Z01151	Cable plug housing angular, 2 m cable 5x0.34 mm ² max. 60 V / 2 A
SLG 6-2	Z01197	Cable plug housing straight, 2 m cable 6x0.25 mm ² max. 36 V / 2 A
SLW 6-2	Z01198	Cable plug housing angular, 2 m cable 6x0.25 mm ² max. 36 V / 2 A
PL-M12	Z01182	Plug-lock for sensors in Ex areas

DATA

Thread	M12x1	Contact resistance	≤ 5 mΩ
Material	PVC	Insulation resistance	>10 ⁹
Protection	IP 67	Testing voltage	2.0 KV eff. / 5 and 6 pol. 1.5 KV eff.
Temperature range	-25...+80 °C		

Note

Sensors with NC output are connected to 4 pole cable plug housings. In this case, the break output is connected to the white lead (connection 2).

A selection

Flow sensors

- Electronical monitoring of flow
- Lubrication monitoring
- Measuring range 0.1 ml/min...100 l/min
- Detection range 1...300 cm/s
- Reaction time 0.5 s

Level sensors for Ex-applications

- For level monitoring in Ex areas
- For temperatures $-35...+200\text{ }^{\circ}\text{C}$
- With PTFE connector cable
- Sensors for connection to amplifiers

Level sensors

- For level monitoring $-230...+230\text{ }^{\circ}\text{C}$
- Steam proof at a pressure of up to 30 bar
- For hot motor oil
- For liquid nitrogen
- For chemically aggressive media

Ultrasonic sensors

- Switching distance up to 6000 mm
- Level monitoring
- Watertight housing
- Teach-in functions

Pressure sensors

- Monitoring in pipes and containers
- Pressure up to 16 bar
- Level up to 10 m ($\pm 1\text{ cm}$)
- Compact models
- Programmable

Infrared detectors

- Measurement of temperature
- Monitoring of hot media
- Position control





Headquarters
EGE-Elektronik
Spezial-Sensoren GmbH

Ravensberg 34
D-24214 Gettorf
Tel. +49 (0) 4346 / 41580
Fax +49 (0) 4346 / 5658

Internet: www.ege-elektronik.com



EGE-Elektronik ApS
Forstallé 79
DK-6200 Aabenraa
Tel. +45 70207271
Fax +45 70207272



EGE-Specialsenserer AB
Stationsgatan 4
S-51250 Svenljunga
Tel. +46 32512060
Fax +46 32512064



Stork AS
Brynsveien 100
N-1352 Kolsås
Tel. +47 67176400
Fax +47 67176401



Vision Systems OY
PL353
FI-40101 Jyväskylä
Tel. +358 (0)10 322 7100
Fax +358 (0)10 322 7119



Molex France
18 Parc Burospace
F-91571 Bièvres Cedex
Tel. +33 2 32 96 04 28
Fax +33 2 32 96 04 21



Cematic-Electric B.V.
Spinel 200
NL-3316 LG Dordrecht
Telefon +31 74 2433422
Telefax +31 74 2913333



ICM Ital Control Meters Srl
Via della Valle 67
I-20048 Carate Brianza (Mi)
Tel. +39 0362 8052 00
Fax +39 0362 8052 01



Bibus Spain, S. L.
Rua do Arroncal, Vial C – Nave 4A
ES-36350 Nigran
Tel. +34 986 247286
Fax +34 986 209247



Powelectrics Limited
Sandy Hill Park, Sandy Way
Amington, Tamworth
GB-Staffordshire B77 4DU
Tel. +44 1827310666
Fax +44 1827310999



Bachofen AG
Ackerstraße 42
CH-8610 Uster
Tel. +41 449441111
Fax +41 449441233



VWR International GmbH
Graumannsgasse 7
A-1150 Wien
Tel. +43 1 97 002 - 0
Fax +43 1 97 002 - 600



Countapulse Controls (PTY) LTD.
P.O.B. 40393
ZA-2022 Cleveland
Tel. +27 116157556
Fax +27 116157513



HITECH Ltd.
1-35-2 Simouma, Setagaya,
JPN-Tokyo 154-0002
Tel. +81 35430 2301
Fax +81 35430 2302



Micromax S&A P/L
Unit 2 106-110 Beaconsfield Street
AUS-Silverwater NSW 2128
Tel. +61 1300 362626
Fax +61 1300 017100



**PROTEK TEKNİK ELEKTRİK
TIC.SAN.LTD.ŞTİ.**
Okçumusa Cad. Kismet Han
No: 36/2 P.K.
TR-34420 Karaköy-Istanbul
Tel. +90 212 237 20 00
Fax +90 212 235 46 09



IAC & Associates
2180 Fasan Drive
Oldcastle
CDN-Ontario N0R 1L0
Tel. +1 519 7370311
Fax +1 519 7370314
TF +1 800 711 1900



Yuden-Tech Co., Ltd.
5F., No. 121, Lide St.,
Zhonghe City, Taipei County 235,
Taiwan (R.O.C.)
Tel. +886 2 8221 2958
Fax +886 2 8221 2492



**Shanghai Beishidietian
Business Trade Co., Ltd.**
4F, No. 88-1, Lane 7039,
Zhongchun Rd., Minhang Area
Shanghai City
Tel. +86 21 54887307
Fax +86 21 54887305



CSE-W. Arthur Fischer Ltd.
15 Polaris Place, Greenmount
NZ-East Tamaki, Auckland
Tel. +64 9271 3810
Fax +64 9265 1362



KOLEKTOR SISTEH d.o.o.
Šlandrova ulica 10
SI-1231 Ljubljana - Črnuče
Slovenija
Tel. +386 1 5636 300
Fax +386 1 7227 930



Introl Sp. z o.o.
ul. Kościuszki 112
40-519 Katowice
Tel. +48 32 789 00 00
Fax +48 32 205 33 77



Bibus Portugal, LDA
Centro Empresarial AAA
Rua Ponte da Pedra, 240 - C4
4470-108 Gueifães - Maia
Porto
Tel. +351 22 906 50 50
Fax +351 22 906 50 53



Futron Electronics PTE Ltd.
1004 Toa Payoh North
#04-08/09/10
Singapore 318995
Tel. +65 6250 2456
Fax +65 6250 6592



Useong Electrade Co.,
D-1006, Technopark
No. 1345, Soha-dong, Gwangmyeong-si
Gyeonggi-do,
Korea
Tel. +82 (0) 2 2686 7314
Fax +82 (0) 2 2686 7316