

Inductive Proximity Sensor

E2Q2

Square Proximity Sensor

- Terminal housing
- Active face changeable to one of every five
- Easy to install and same mounting dimensions as a standard style electromechanical limit switch
- Integrated short circuit and reverse polarity protection
- Robust body with stainless steel screws



Ordering Information

DC type

Sensing distance	Connection	Active face	Output		
				NO	NO + NC
20 mm shielded	Terminals / Connector*	Changeable	NPN	E2Q2-N20E1-G	E2Q2-N20E3- *
			PNP	E2Q2-N20F1-G	E2Q2-N20F3- *
30 mm non shielded	Terminals / Connector*	Changeable	NPN		E2Q2-N30ME3- *
			PNP		E2Q2-N30MF3- *

* = G : terminal conduit PG 13,5
 U : terminal conduit ½" NPT
 50 : BHMS4 connector, North American style

AC type

Sensing distance	Connection	Active face	Output		
				NO	NO or NC
15 mm shielded	Terminals / Connector*	Changeable	AC		E2Q2-N15Y4- *
30 mm non shielded	Terminals / Connector*	Changeable	AC		E2Q2-N30MY4- *

* = G : terminal conduit PG 13,5
 U : terminal conduit ½" NPT
 50 : BHMS3 connector, North American style



Weld-Field Immune DC type (100 mT)

Sensing distance	Connection	Active face	Output		
				NO	NO + NC
15 mm shielded	Terminal conduit ½" NPT	Changeable	PNP	E2Q2-N15F1-51	
15 mm shielded	BHMS4-Connector	Changeable	PNP	E2Q2-N15F1-52	



Weld-Field Immune AC type (100 mT)

Sensing distance	Connection	Active face	Output		
				NO	NO or NC
15 mm shielded	Terminal conduit ½" NPT	Changeable	AC		E2Q2-N15Y4-51
15 mm shielded	BHMS3-Connector	Changeable	AC		E2Q2-N15Y4-52

Specifications for DC type

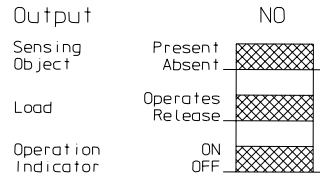
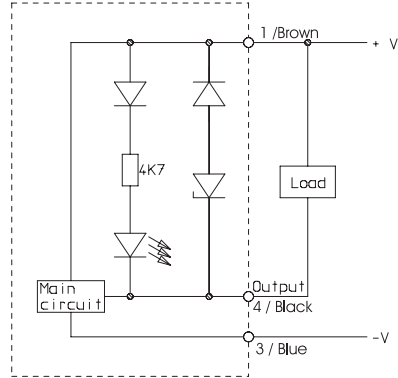
Operating voltage	10 to 60 VDC/10 to 30 VDC weld-field immune types
Current consumption	max. 20 mA / max 10 mA E2Q2-N30... types
Sensing object	Ferrous metals
Sensing distance Sn ...-N15... (Standard target size, L x W x H, Fe 37) ...-N20... (Standard target size, L x W x H, Fe 37) ...-N30... (Standard target size, L x W x H, Fe 37)	15 mm \pm 10%, shielded (45 x 45 x 1 mm) 20 mm \pm 10%, shielded (60 x 60 x 1 mm) 30 mm \pm 10%, non shielded (90 x 90 x 1 mm)
Setting distance	...-N15... 0 to 12,15 mm ...-N20... 0 to 16,2 mm ...-N30... 0 to 24,3 mm
Differential travel	15 % max. of sensing distance Sn
Switching frequency	...N20...:150 Hz / ...N30...:100 Hz / ...N15... : 10Hz weld-field immune types
Control output	Type E2Q2-N15F1-51: PNP - NO E2Q2-N15F1-52: PNP - NO E2Q2-N20E1- : NPN-NO E2Q2-N20F1- : PNP-NO E2Q2-N20E3- : NPN - NC+NC E2Q2-N20F3- : PNP - NC+NC E2Q2-N30ME3- : NPN - NC+NC E2Q2-N30MF3- : PNP - NC+NC
	Max-Load 200 mA
	Max on-state voltage drop 3 VDC (at 200 mA load current)
Circuit protection	Reverse polarity, output short circuit
Alternating magn. field	100 mT
Indicator	Operating indicator (yellow LED)
Ambient temperature	Operating: -25° to 70°C
Humidity	35 to 95 % RH
Influence of temperature	\pm 10 % max. of Sn at 23°C in temperature range of -25° to 70°C
Dielectric strength	1.500 VAC, 50/60 Hz for 1 min. between current carry parts and case
Electromagnetic compatibility EMC	EN 60947-5-2
Vibration resistance	10 to 55 Hz, 1 mm amplitude according to IEC 60068-2-6
Shock resistance	approx. 30 G for 11 ms according to IEC 60068-2-27
Degree of protection	IP 67 (EN 60947-1)
Connection	Terminals Up to 2,5 mm ²
Material	Case PBT Terminal base Al / .. - G Type: PBT Sensing face PBT
Approvals	 CERTIFIED  LISTED

Specifications for AC type

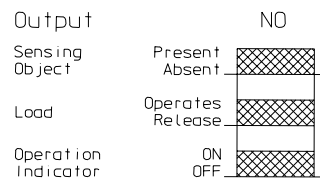
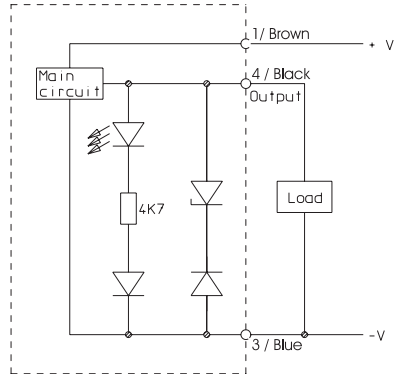
Operating voltage	20 to 253 VAC
Off-state current	max. 1,9 mA / max 2,5 mA weld-field immune types
Sensing object	Ferrous metals
Sensing distance Sn ...-N15... (Standard target size, L x W x H, Fe 37) ...-N30... (Standard target size, L x W x H, Fe 37)	15 mm \pm 10%, shielded (45 x 45 x 1 mm) 30 mm \pm 10%, non shielded (90 x 90 x 1 mm)
Setting distance ...-N15... ...-N30...	0 to 12,15 mm 0 to 24,3 mm
Differential travel	15 % max. of sensing distance Sn
Response frequency	20 Hz
Control output Type	E2Q2-N15Y4-G: AC -NO or NC E2Q2-N15Y4-U: AC - NO or NC E2Q2-N15Y4-50: AC - NO or NC E2Q2-N15Y4-51: AC - NO or NC E2Q2-N15Y4-52: AC - NO or NC E2Q2-N30MY4-G: AC -NO or NC E2Q2-N30MY4-U: AC - NO or NC E2Q2-N30MY4-50: AC - NO or NC
Max-Load	500 mA
Min-Load	8 mA / 10 mA weld-field immune types
Max on-state voltage drop	12 VAC (at 500 mA load current)
Circuit protection	none
Alternating magn. field	100 mT
Indicator	Operating indicator (yellow LED)
Ambient temperature	Operating: -25° to 70°C
Humidity	35 to 95 % RH
Influence of temperature	\pm 10 % max. of Sn at 23°C in temperature range of -25° to 70°C
Dielectric strength	1.500 VAC, / 2500 VAC E2Q2-...-G between current carry parts and case
Electromagnetic compatibility EMC	EN 60947-5-2
Vibration resistance	10 to 55 Hz, 1 mm amplitude according to IEC 60068-2-6
Shock resistance	approx. 30 G for 11 ms according to IEC 60068-2-27
Degree of protection	IP 67 (EN 60947-1)
Connection Terminals	Up to 2,5 mm ²
Material Case	PBT
Terminal base	Al / .. - G Type: PBT
Sensing face	PBT
Approvals	 CERTIFIED  LISTED

Output Circuit Diagram and Timing Chart

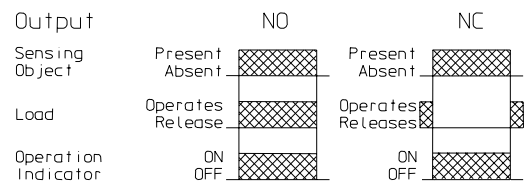
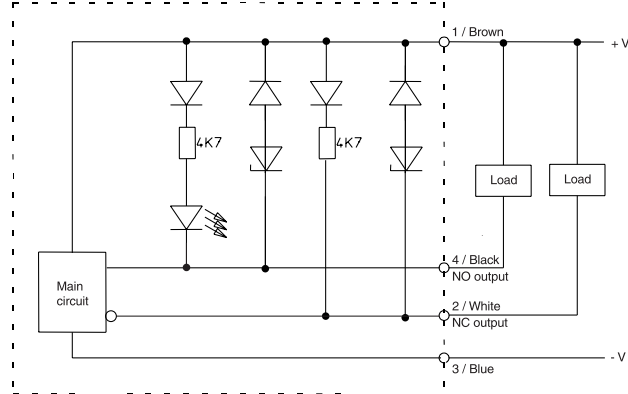
NPN Output



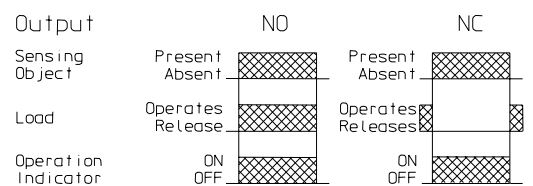
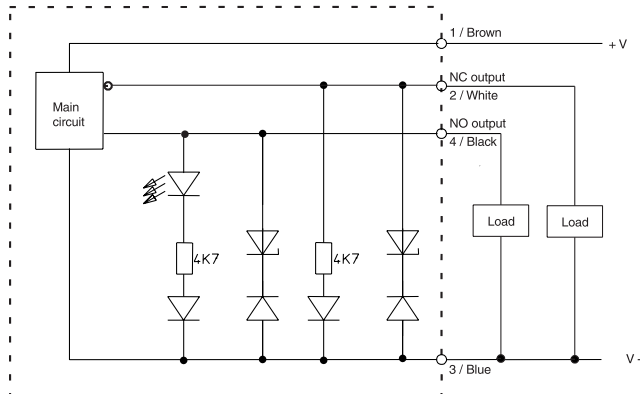
PNP Output



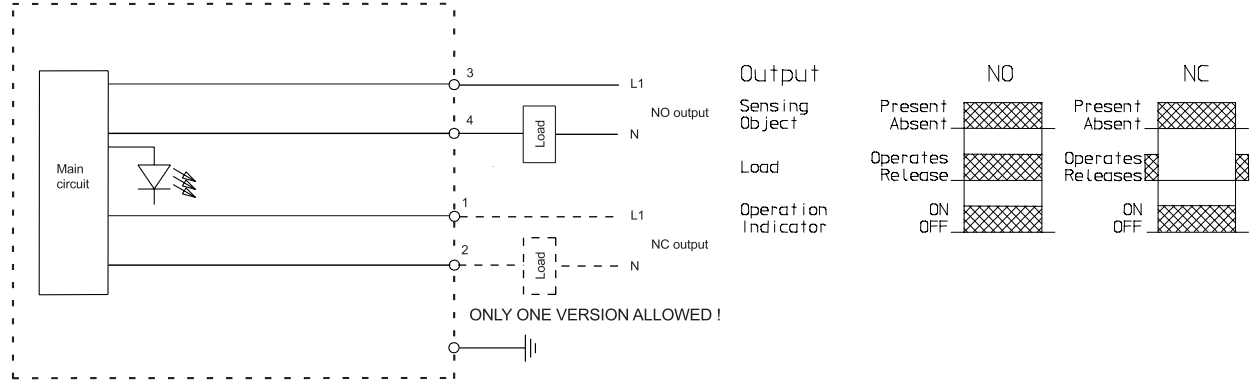
NPN NO + NC output



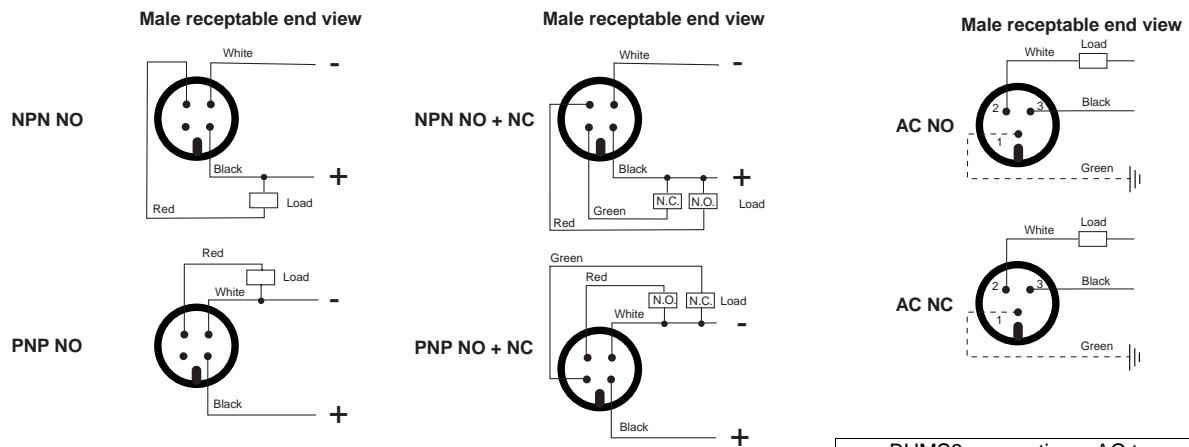
PNP NO + NC output



AC NO or NC output



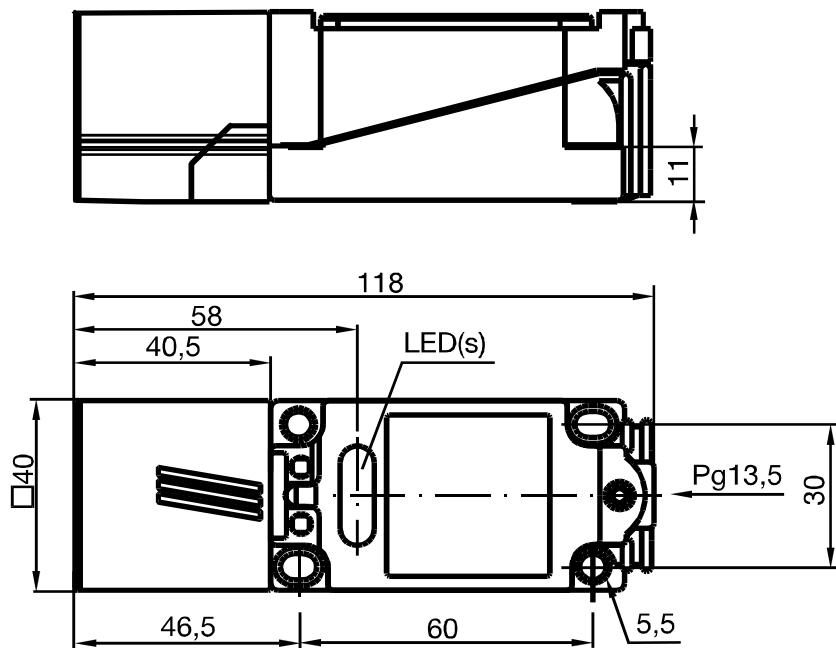
BHMS connections



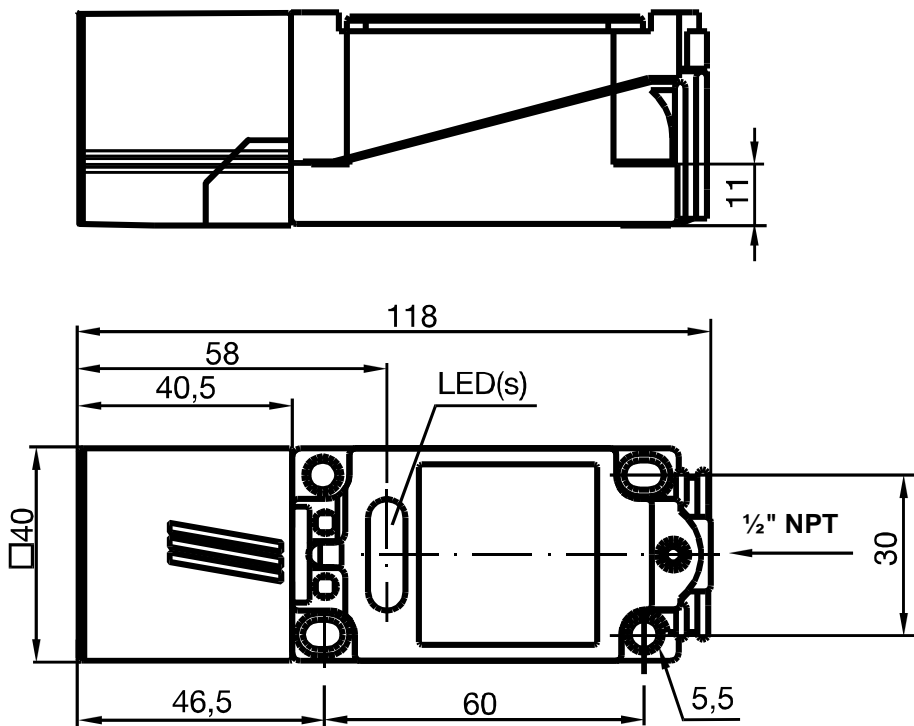
BHMS3 connections, AC types			
Function	State	BHMS Connector	Intern terminals
NO	At factory	2	3
		3	4
NC	Change by user	2	1
		3	2

Dimensions

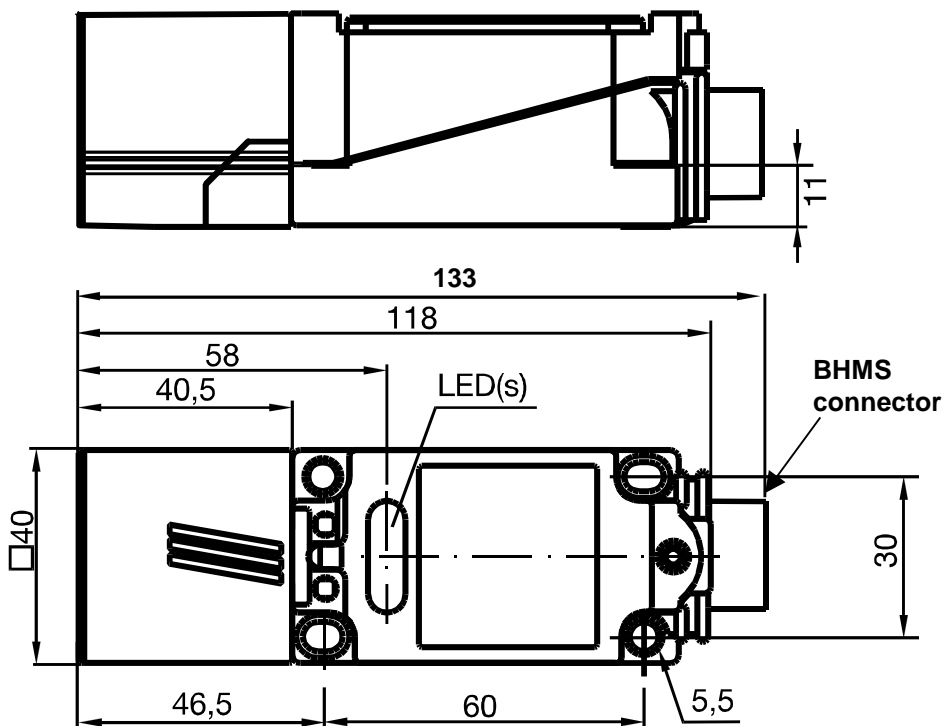
-G type



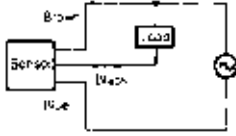
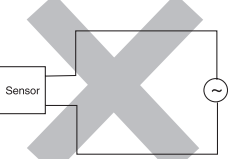
-U and -51 type



-50 and -52 type



Caution

Item	Examples
<p>Power Supply</p> <p>Do not impose an excessive voltage on the E2Q2, otherwise it may explode or burn.</p> <p>Do not impose AC voltage on any E2Q2 DC model, otherwise it may explode or burn.</p>	
<p>Do not connect the AC types without load to the power supply. The sensor will be damaged.</p>	

Correct Use

Installation

Power Reset Time

The Proximity Sensor is ready to operate within 300 ms after power is supplied. If power supplies are connected to the Proximity Sensor and load respectively, be sure to supply power to the Proximity Sensor before supplying power to the load.

Power OFF

The Proximity Sensor may output a pulse signal when it is turned off. Therefore, it is recommended to turn off the load before turning off the Proximity Sensor.

Power Supply Transformer

When using a DC power supply, make sure that the DC power supply has an insulated transformer. Do not use a DC power supply with an auto-transformer.

Sensing Object

Metal Coating:

The sensing distance of the Proximity Sensor vary with the metal coating on sensing objects.

Wiring

High-tension Lines

Wiring through Metal Conduit

If there is a power or high-tension line near the cable of the Proximity Sensor, wire the cable through an independent metal conduit to prevent against Proximity Sensor damage or malfunctioning.

Mounting

The Proximity Sensor must not be subjected to excessive shock with a hammer when it is installed, otherwise the Proximity Sensor may be damaged or lose the water-resistivity.

Environment

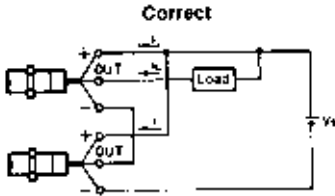
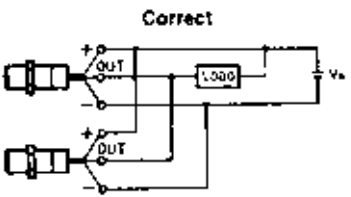
Water-resistivity

Do not use the Proximity Sensor underwater, outdoors or in the rain.

Operating Environment

Be sure to use the Proximity Sensor within operating ambient temperature range and do not use the Proximity Sensor outdoors so that its reliability and life expectancy can be maintained. Although the Proximity Sensor is water resistive, a cover to protect the Proximity Sensor from water or soluble machining oil is recommended so that its reliability and life expectancy can be maintained. Do not use the Proximity Sensor in an environment with chemical gas (e. g., strong alkaline or acid gases including nitric, chromic, and concentrated sulfuric acid gases).

DC Type

Connection type	Method	Description
AND (serial connection)		<p>The Sensors connected together must satisfy the following conditions:</p> $i_L + (N-1) \times i \leq \text{Upper-limit of control output of each Sensor}$ $V_S - N \times V_R \geq \text{Load operating voltage}$ <p> N = No. of Sensors V_R = Residual voltage of each Sensor V_S = Supply voltage i = Current consumption of the Sensor i_L = Load current </p> <p>If the MY Relay, which operate at 24 VDC, is used as a load for example, a maximum of two Proximity Sensors can be connected to the load.</p>
OR (parallel connection)		<p>A minimum of three Sensors with current outputs can be connected in parallel. The number of Sensors connected in parallel varies with the Proximity Sensor model.</p>

AC Type

Connection type	Method	Description
AND (serial connection)		<p>If 100 or 200 VAC is imposed on the Proximity Sensors, V_L (i.e., the voltage imposed on the load) will be obtained from the following.</p> $V_L = V_S - (\text{residual voltage} \times \text{no. of Proximity Sensors}) (V)$ <p>Therefore, if V_L is lower than the load operating voltage, the load will not operate.</p> <p>A maximum of three Proximity Sensors can be connected in series provided that the supply voltage is 100 V minimum.</p>
OR (parallel connection)		<p>In principle, more than two Proximity Sensors cannot be connected in parallel.</p> <p>Provided that Proximity Sensor A does not operate with Proximity Sensor B simultaneously and there is no need to keep the load operating continuously, the Proximity Sensors can be connected in parallel. In this case, however, due to the total leakage current of the Proximity Sensors, the load may not reset properly.</p> <p>It is not possible to keep the load operating continuously with Proximity Sensors A and B in simultaneous operation to sense sensing objects due to the following reason.</p> <p>When Proximity Sensor A is ON, the voltage imposed on Proximity Sensor A will drop to approximately 10 V and the load current flows into Proximity Sensor A, and when one of the sensing objects is close to Proximity Sensor B, Proximity Sensor B will not operate because the voltage imposed on Proximity Sensor B is 10 V, which is too low. When Proximity Sensor A is OFF, the voltage imposed on Proximity Sensor B will reach the supply voltage and Proximity Sensor B will be ON. Then, Proximity Sensor A as well as Proximity Sensor B will be OFF for approximately 10 ms, which resets the load for an instant. To prevent the instantaneous resetting of the load, use a relay as shown on the left.</p>



3gfZad[eW 6[efdTgfad,z

ASH & ALAIN INDIA PVT LTD

S-100, F.I.E.E., Okhla Industrial Area, Phase-ii, New Delhi-110020(India)

Tel : 011-43797575 Fax : 011-43797574 E-mail : sales@ashalain.com