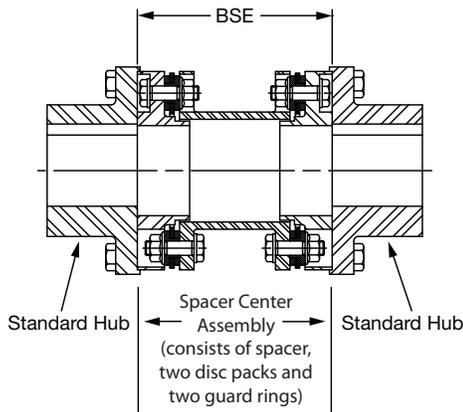


DODGE® Disc Coupling Installation Manual

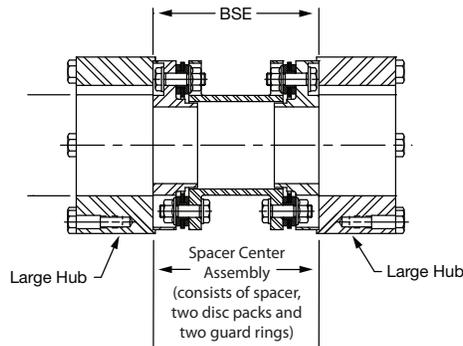
Includes ATEX Approved Couplings

These instructions must be read thoroughly before installing or operating this product. Video walkthroughs of each installation and maintenance procedure are available by scanning the QR codes at the beginning of each section. Videos should be used as an accompaniment to the instruction manual and not intended to replace the written instructions. The instruction manual was correct at the time of printing. Please see www.baldor.com for updated instruction manual.

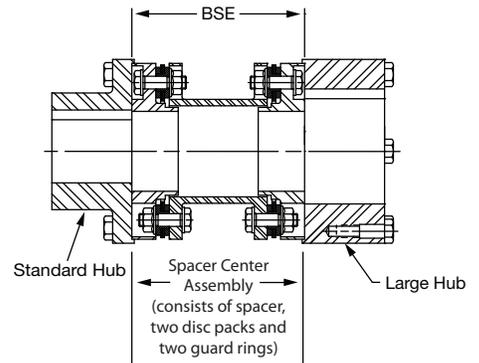
Disc Coupling Configurations



Standard Hub Disc Coupling Configuration



Large Hub Disc Coupling Configuration



Standard Hub - Large Hub Disc Coupling Configuration

General Installation

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out power source before proceeding. Failure to observe these precautions could result in bodily injury.

WARNING: All products over 25 kg (55 lbs) are noted on the shipping package. Proper lifting practices are required for those products.

Before beginning installation, the coupling should be examined for any signs of damage that may have occurred during shipping and handling. Confirm that all components are included in the shipment.

For maximum protection, the coupling and components should be stored in the original packaging.

Measurements should be made to verify correctness of parts to meet application requirements, such as hub bore diameter, shaft diameter, and shaft separation.

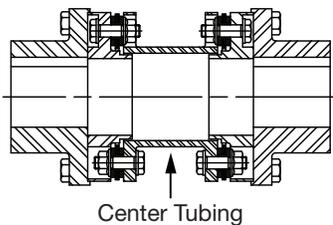
NOTE: Dodge Series Disc Couplings are shipped assembled, except for the Hubs and the Accessory Kit.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

Dodge Component Preparation

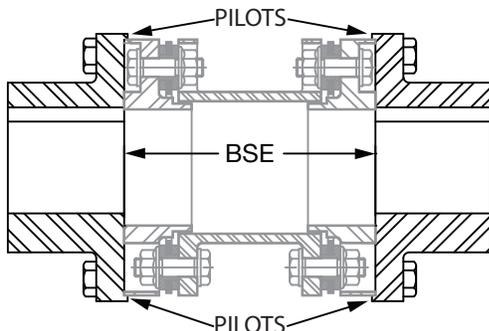


1. A complete spacer coupling consists of two hubs, one spacer center assembly and six bolts for standard hub or nine bolts per larger hub.
2. Clean the exposed surfaces of all components, hubs, sub-assemblies, and spacers to remove any protective coating applied at the factory. All parts must be clean and free of any foreign materials before attempting installation or assembly. Use a clean cloth dampened with a nonflammable solvent as needed.
3. Check hub bores, keyways, guard rings and shafts for any raised metal, nicks, burrs, dents, gouges or other irregularities. Address if necessary.
4. Support the spacer center assembly only by the center tubing, loosen the red shipping bolts (if included) in the new spacer center assembly until only the red spacers can be removed, leaving the red bolts engaged.



5. With the red shipping bolts (if included) loosened to allow the disc packs to fully extend, measure the length of the spacer assembly and verify the length matches the measured Between Shaft Ends (BSE).
6. Prior to removing the existing coupling, check the measurement of the BSE between the driver and driven hubs and compare that to the drop in spacer assembly of the new disc coupling to verify fit.

NOTE: When measuring the BSE, measure from the ends of the shafts or the hub flange faces, not from the hub's Pilots.



7. Once all necessary measurements are taken and all components are verified as correct, the red shipping bolts, if included, can be tightened to compress the disc packs.
8. If there are no red shipping bolts, then three standard hub bolts, or the three short bolts (per side) with a large hub, should be used to compress the disc pack.

CAUTION: Do Not Use Power Tools to compress disc packs. With the red shipping spacers removed, it is possible to over-compress the disc packs when re-tightening the bolts, causing the disc packs to deform and making the coupling impossible to properly align or compromise its strength.

9. This compression should allow adequate clearance when installing the spacer assembly between the hubs.

Each bolt should be tightened equally to allow for uniform compression. Be sure to install compression bolts on the inside of the guard rings so that the spacer assembly can be dropped into place.

NOTE: Do not compress disc packs more than the allowable axial misalignment as shown in Table 3.

10. Remove the existing coupling.

Hub Installation

NOTE: Dodge Disc Couplings are supplied with inch dimensioned straight disc hub bores with keyway to ANSI/AGMA 9002-B04 standard for interference fit unless otherwise specified.

NOTE: Dodge Disc Couplings are supplied with metric dimensioned straight disc hub bores with keyway ISO/R775-H7 standard for interference fit unless otherwise specified.

CAUTION: Hubs must be supported during installation to avoid accidental damage should they slip.

1. Straight Bore Clearance Fits: Install key(s) in the shaft. The key(s) should have a snug side-to-side fit with a small clearance over the top. To maintain dynamic balance, the key(s) should fit exactly and not be too short or long. Align hub and shaft key(s), then slide hub on the shaft.
2. Straight Bore Interference Fit: This type of installation is for straight shafts, with the exception that the hubs must be heated before they are slid onto the shaft.

It is important when mounting interference fit hubs to make sure that clearance exists over the top of keys. If there is no clearance, when the hub cools, it will rest on the key and produce high stresses in the hub that could cause the coupling to fail. Expand the hub bore with a uniform heat source: oil, oven or induction.

Oil bath heating is usually limited to approximately 350°F (177°C), or less than the flash point of the oil used. Special handling devices are required such as tongs, threaded rods placed in puller holes in the hub, etc.

WARNING: If an oil bath is used, the oil must have a flash point of 350° F (177°C) or higher. Do not rest hubs on the bottom of the container.

Oven heating offers some advantages over oil. Parts can be heated to higher temperatures, usually not exceeding 600°F (315°C) and the parts can be handled with heat-resistant gloves. Do not rest hubs on the bottom of the oven; place them on a rack in the middle of the oven.

An induction heater can be used as long as the temperature rise is controlled.

WARNING: Do not use an open flame in a combustible atmosphere or near combustible materials.

Open flame heating is not recommended. If an oxy-acetylene or blow torch is used, use an excess acetylene mixture. Mark the hub body at the top, center, and bottom of their length in several places with heat sensitive crayons, one 350°F (177°C) and one 450°F (232°C) melt temperature.

Elevate the hub with refractory bricks to allow the flame to flow through the hub. With a "Blue flame" or "Rose bud torch", direct the flame towards the hub bore using constant motion to avoid overheating an area. Once the heat sensitive crayons melt, the hub is ready for mounting.

WARNING: Consult all applicable Federal, State and local laws and regulations covering the safe operation and maintenance of equipment, including, without limitation, the USDOL-OSHA "Lockout / Tag out" procedure set forth in 29 CFR 1910.147.

CAUTION: Do not spot heat the hub or distortion may occur. Regardless of method used, heat **MUST** be applied evenly to avoid distortion. This is especially important when using open flame heating. In any event, extreme care must be exercised when handling heated hubs to avoid injury.

CAUTION: Do not exceed 600°F (315°C) during the heating of the hub. Excessive heat may soften the hub, reducing the strength of the steel and may affect the performance characteristics of the hub.

Dodge Disc Coupling Center Assembly



1. When the hubs are mounted flush with the end of the shafts and cooled, put the last piece of drive equipment into place and set the gap to the “BSE” (Between Shaft Ends).

If hubs are not mounted flush with the end of the shaft, the spacer assembly may not seat inside the pilots correctly.

NOTE: When measuring the BSE, measure from the ends of the shafts or the hub flange faces, not from the hub’s Pilots.

2. Place the spacer center assembly between the hubs and align the bolt holes of the guard ring of the spacer center assembly with the bolt holes of the rigid hub. Do not install fasteners.

NOTE: The disc packs must be compressed to allow the spacer assembly to slip between the hubs. Each disc coupling is shipped with bolts (red shipping bolts for larger units, short bolts in large units and standard hub bolts in standard units) that should be used to compress the disk pack.

On the least accessible side of the coupling, insert the first bolt through the hub, thread into the guard ring of the spacer assembly and hand tighten, making sure the pilots are properly mated. Do not torque the bolt at this time.

3. With one bolt in place, adjust the spacer center assembly so that all bolt holes are in-line with the mating hub and guard ring. Install a second bolt at the opposite end of the bolt circle and hand tighten, making sure the pilots are properly mated. Install three compression bolts per coupling half in the same manner making sure that bolts are not torqued at this time.
4. Before removing all the bolts used to compress the disc packs during placement of the spacer center assembly, rotate the other hub, so that the hub bolt holes line up with the spacer assembly’s guard ring bolt holes and the pilots are properly mated.
5. Remove all the bolts used to compress the disc packs while making sure the pilots are properly mated.
6. With other hub rotated, so that the hub bolt holes line up with the bolt holes of the spacer center assembly guard ring, insert the first bolt through the hub, thread into the guard ring of the spacer center assembly and hand tighten.
7. After the first bolt is in place, insert a second bolt at the opposite end of the bolt circle and hand tighten.
8. Install all remaining bolts on that end of the coupling and hand tighten each one.
9. Torque all the bolts on both sides of the coupling following the torquing procedure.
10. Make sure all the bolts used to compress the disc packs have been removed.
11. Follow the Machinery Alignment instructions.

Hub Bolt Torquing Procedure

Bolts should be tightened to the recommended torque specification in the following steps:

1. All bolts should be tightened to one half of the torque tightening values, as shown in Table 1, in a crisscross fashion. Once all bolts have been tightened to half of the torque tightening value, follow the same crisscross pattern and torque to the final torque value as shown in Table 1.
2. Finally, check the first bolt tightened to assure it has maintained its torque value after all bolts have been tightened. If it does not meet the torque value in Table 1 follow the same crisscross pattern and torque all bolts again.

NOTE: Only the high strength bolts supplied with the hardware kit and DODGE Disc Coupling should be used when installing the center assembly and hubs. These bolts should also be torqued to the proper ratings supplied in Table 1. This is to ensure proper operation of the coupling, and prevent premature failure.

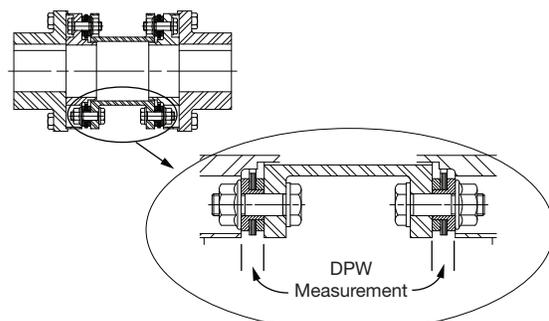
Table 1 - Dodge Disc Hub Bolts

Hub Size	Standard Bolt No. & Size	Large Bolt No. & Size	Tightening Torque Nm	Tightening Torque lb-ft
94	12 M6 x 20	12 M6 x 50	15	11
115	12 M8 x 25	12 M8 x 70	35	26
139	12 M8 x 25	12 M8 x 80	35	26
165	12 M10 x 30	12 M10 x 90	69	51
193	12 M12 x 40	12 M12 x 100	120	89
210	12 M14 x 45	12 M14 x 110	190	140
236	12 M16 x 50	12 M16 x 130	295	218
263	12 M20 x 60	12 M20 x 150	580	428
286	12 M20 x 60	12 M20 x 160	580	428
310	12 M22 x 70	12 M22 x 170	780	575

Machinery Alignment



1. Optical methods of alignment (such as using a laser) are recommended.
2. The useful life of any Disc Coupling is directly influenced by the operating misalignment; the better the alignment, the longer the coupling life. The coupling alignment should be checked periodically. Even when a coupling is well aligned at installation, subsequent settling of foundations or shifting of equipment, may cause the alignment to deteriorate.
3. Realignment of the equipment may not be necessary if the Disc Pack Width (DPW) measurements are within acceptable limits, per Table 2, at four points on each disc pack.



4. If the equipment can be realigned without much movement of the equipment (only adding a few adjustment shims to the corners of the equipment), then the disc coupling may remain in place during the alignment procedure.
5. If major equipment movement is required (such as removing all adjustment shims from one or more corners of the equipment), then the disc coupling should be removed prior to the alignment procedure and reinstalled after the equipment is aligned.
6. Soft Foot: The equipment must sit flat on its base. Any soft foot must be corrected now.
7. The axial misalignment allowable between shafts during installation should not exceed 20% of the allowable misalignment given in Table 2. This misalignment is a function of the coupling size and the number of bolts utilized. The larger the size, the larger the axial displacement.
8. The axial displacement creates large stresses in the disc pack. For a long life, it is recommended that the axial spacing of the shafts be positioned so that the disc pack is flat when the equipment is operating under normal conditions. This means there is a minimal amount of waviness in the disc pack when viewed from the side. This will result in a flexing element that is centered and parallel to its mating flange faces.
9. When coupling motors utilizing output sleeve bearings, magnetic center must be determined to minimize axial misalignments. Magnetic center of the motor can be found by running the motor and lightly scribing a line at the point at which the shaft and the motor housing meet. This line should then be used as a reference point for axially aligning the coupling. Move the connecting equipment or the hubs on their respective shafts to accomplish this.
10. Thermal expansion of the shafts should be carefully considered. Example: if the between shaft ends (BSE) change by 0.015" (the shafts are coming closer to each other) from cold to hot machinery, the BSE with cold machinery should intentionally be made larger by 0.015" when the coupling is installed.
11. Measuring using a caliper and recording each Disc Pack Width (DPW) at four radial locations (approximately 3, 6, 9 & 12 O'clock) will be the final step in the installation. If the DPW dimension at each location on each disc pack is within the upper and lower limits of Table 2 the installation is complete.
12. If the DPW dimension on the disc packs is not within the limits, calculate the average of the DPW measurements for the drive and driven side of the coupling.
13. Calculate the difference between the recorded average DPW value and the Table 2 value of the DPW for the drive and driven side of the coupling.
This represents how much to adjust the hubs on each side of the coupling. A positive number indicates expanded disc packs and the need to move the hubs inboard. A negative number indicates compressed disc packs and the need to move the hubs outboard.
If no hubs have to be moved, and there is at least one DPW measurement that is beyond the upper or lower limit, the equipment may have to be realigned.

CAUTION: When using the DPW measurement to determine axial displacement, remember that angular misalignment will affect the DPW measurement.

NOTE: When reinstalling the coupling guard verify that the new coupling has enough clearance so as not to come in contact with the guard and that there is visibility to inspect the disc pack during operation.

Static Disc Coupling Inspection



When the equipment is stopped, the coupling should be examined for any signs of damage, wear or fatigue that may have occurred during normal operation of the equipment. Making sure to inspect the complete coupling on all sides.

1. Inspect all of the fasteners for signs of damage, wear or fatigue, making sure they meet the correct torque values and replace or re-torque as necessary.
2. Inspect hubs, spacers, mounting rings or guard rings of the coupling for signs of damage, wear, or fatigue and replace as necessary.
3. Inspect the disc pack bushings for signs of cracks or breaks and replace the complete disc pack if necessary.
4. Inspect the disc pack(s) for signs of damage, wear, fatigue or separation of the discs within the disc pack and replace the complete disc pack if necessary.

Table 2 - Axial Tolerance

Size	Axial Misalignment		Angular Misalignment Max	DPW Disc Pack Width		+/- Tolerance		DPW Lo		DPW High	
	in	mm		in	mm	in	mm	in	mm	in	mm
94	0.0295	0.75	1.5°	0.295	7.5	0.003	0.08	0.292	7.43	0.298	7.58
115	0.0413	1.05		0.331	8.4	0.004	0.11	0.327	8.30	0.335	8.51
139	0.0512	1.30		0.331	8.4	0.005	0.13	0.326	8.27	0.336	8.53
165	0.0610	1.55		0.441	11.2	0.006	0.16	0.435	11.05	0.447	11.36
193	0.0728	1.85		0.551	14.0	0.007	0.19	0.544	13.82	0.558	14.19
210	0.0748	1.90	1°	0.610	15.5	0.007	0.19	0.603	15.31	0.617	15.69
236	0.0827	2.10		0.689	17.5	0.008	0.21	0.681	17.29	0.697	17.71
263	0.0925	2.35		0.807	20.5	0.009	0.24	0.798	20.27	0.816	20.74
286	0.1024	2.60		0.835	21.2	0.010	0.26	0.825	20.94	0.845	21.46
310	0.1122	2.85		0.961	24.4	0.011	0.29	0.950	24.12	0.972	24.69

Operational Disc Coupling Inspection

While the equipment is operational and with the use of a strobe light, the disc pack of the coupling may be examined for any signs of damage, wear, fatigue or misalignment that may have occurred during normal operation of the equipment.

1. Gain visual access of the disc pack(s) through the safety guard, either through a screen or hatch area.
2. Adjust the strobe light so that the disc pack is at a standstill.
 - a. Check for cracks or breaks in the bushings.
 - b. Check for broken, frayed or cracked discs within the disc pack(s).
 - c. Check for separation of the discs in the disc pack(s).
 - d. Check for waviness or distortion in the disc pack (Signals possible misalignment).
 - e. If any of the above conditions exist the complete spacer center assembly may have to be replaced.
3. After a thorough inspection and it is determined that the spacer center assembly will need replacement, a decision on when to make that replacement must be made. The time frame for the spacer center assembly replacement will be dependent on the degree of damage, wear or fatigue. The more excessive the damage, wear or fatigue to the disc pack(s), the sooner the replacement must be made. In all cases the spacer center assembly replacement must be made before complete failure of the disc pack(s) occurs.

NOTE: When replacing disc packs, the packs should be replaced as a pair.

Please be advised that the clearance hole diameter of the coupling may be smaller than the outside diameter of some typical sockets. The OD of the socket may have to be turned down to 0.76 mm (0.030") smaller than the hole diameter clearance of the coupling. For additional information contact Dodge Product Support.

ATEX Approved Disc Couplings

These instructions do not cover all details or variations in equipment nor provide every possible contingency or hazard to be met in connection with installation, operation, and maintenance. Should further information be desired, or should particular problems arise which are not covered in this manual, the matter should be referred to your local representative.

DODGE Disc couplings are manufactured under the guidelines of the ATEX directive 2014/34/EU. DODGE Disc couplings are suitable for ATEX category 2 and M2, Group II and I for gas and dust environments and are also suitable for ATEX category 3 for all gas or dust environments with ignition temperatures higher than $T4 = 135^{\circ}\text{C}$ for all sizes, and $T5 = 100^{\circ}\text{C}$ for sizes 210 and smaller. A UL Certified adhesive label indicating ATEX certification will be attached to the product or on the box containing the product and will contain the following depending on size and ambient temperature:

ATEX Marking Information

A sticker indicating ATEX Certification will be attached to the product or on the box containing the product and will be similar to the following:

For Sizes 94 to 210 with an ambient range -30°C to $+50^{\circ}\text{C}$

- II 2 GD c 100°C (T5)
- I M2 c
- Tamb -30°C to $+50^{\circ}\text{C}$
- SIRA 14 ATEX 6060X
- DODGE Disc Coupling Size **
- MFG IN USA, GREENVILLE SC/FORT SMITH AR
-  

For Sizes 94 to 310 with an ambient range -30°C to $+65^{\circ}\text{C}$

- II 2 GD c 135°C (T4)
- I M2 c
- Tamb -30°C to $+65^{\circ}\text{C}$
- SIRA 14 ATEX 6060X
- DODGE Disc Coupling Size **
- MFG IN USA, GREENVILLE SC/FORT SMITH AR
-  

Hazardous Area Use

For hazardous area use, the following potential ignition hazards have been identified.

- Impact to outer enclosures
- Heat Generation from flexing or breaking of disc back due to excessive torque and/or misalignment
- Frictional sparking from contact with stationary parts either by coupling failure or incorrect installation

These potential hazards have been addressed by the materials and design of the coupling and rely on correct installation and maintenance, as detailed in the equipment instructions.

WARNING: These couplings are designed to operate with surface temperatures below 135°C when properly installed and selected. Excessive temperatures greater than 80°C is a result of an abnormal operating condition caused by:

1. **Improper installation - refer to installation manual for proper procedures**
2. **Excessive misalignment - re-align coupling / shafts**
3. **Failure of the coupling disc pack - replace center assembly**
4. **Excessive speed - re-evaluate application and selection**
5. **Excessive vibration - determine source, re-evaluate application**

If applied in a Division 1 or Zone 1 environment, the excessive temperature may cause ignition of hazardous materials.

In hazardous environments, DODGE Disc couplings should not be considered as fail safe or “break-away” power transmission devices. Overloads imposed to these devices could cause irreparable damage, shall be considered an explosive hazard, could create projectiles, and/or could cause torque transmission interruptions. The coupling shall be sized and used to the stated torque capabilities of the unit as published in the DODGE PT Components Engineering Catalog. Any assistance needed in selection shall be referred to a Baldor representative.

Additional Instruction for Safe Installation and Use

1. All rotating parts should be guarded to prevent contact with foreign objects which could result in sparks, ignition, or damage to the coupling.
2. Couplings should be periodically inspected for normal wear, dust/dirt buildup, cracks or bend in disc packs, or any similar scenario that would impede heat dissipation.
3. Increasing levels of vibration and noise could indicate the need for inspection, repair or replacement of the coupling or element.
4. Electrical sparks are a source of ignition. To reduce the risk, proper electrical bonding and grounding is recommended.
5. Overloading may result in breakage or damage to the coupling disc packs or other equipment. As a result the coupling could become an explosion hazard. Damaged coupling components must not be operated in hazardous environment.
6. Disc Couplings are not intended to be used as thrust bearing members.
7. Coupling guards should have a minimum of 2” clearance over DODGE Disc Couplings.
8. The Coupling shall be suitably protected from impact by falling objects.
9. The operating temperature for DODGE Disc Couplings must remain in the range of -40°F to 450°F (-40°C to 232°C).

EU Declaration of Conformity

The undersigned, representing the following supplier and the following authorised representative:

Baldor Electric Company
5711 R. S. Boreham, Jr. Street
Fort Smith, Arkansas 72901
USA

ABB Automation Products GmbH
Oberhausener Straße 33
40472 Ratingen, Germany

*This declaration is issued under the sole responsibility of the manufacturer.
herewith declare that the Products*

Couplings 

*Product identification (brand and
catalogue number/part number):*

Dodge Disc Couplings:

I M2 c Sizes 94 to 310 with an ambient range of -30°C to +65°C

II 2 GD c 135°C (T4) Sizes 94 to 310 with an ambient range of -30°C to +65°C

II 2 GD c 100°C (T5)

Sizes 94 to 210 with an ambient range of -30°C to +50°C

are in conformity with the provisions of the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation:

2014/34/EU

ATEX

and that the standards and/or technical specifications referenced below have been applied:

EN 13463-1:2009

Non - Electrical Equipment For Potentially Explosive Atmospheres -Method And Requirements

EN13463-5:2011

Non - Electrical Equipment For Potentially Explosive Atmospheres -Method And Requirement Part 5: Protection by constructional safety 'c' s

Notified Body:

Sira Certification Services Ltd
Unit 6
Hawarden Industrial Park
Hawarden
DEESIDE
CH5 3US

Certificate: SIRA 14ATEX6060X

Supplier:

Signature



Signature



Name: L. Evans Massey
Position: Manager Standards and Certification

Name: Michael Klein
Position: Regional Sales and Marketing Manager Central Europe

Date: 20 June 2016

Date: 20 June 2016

BALDOR

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