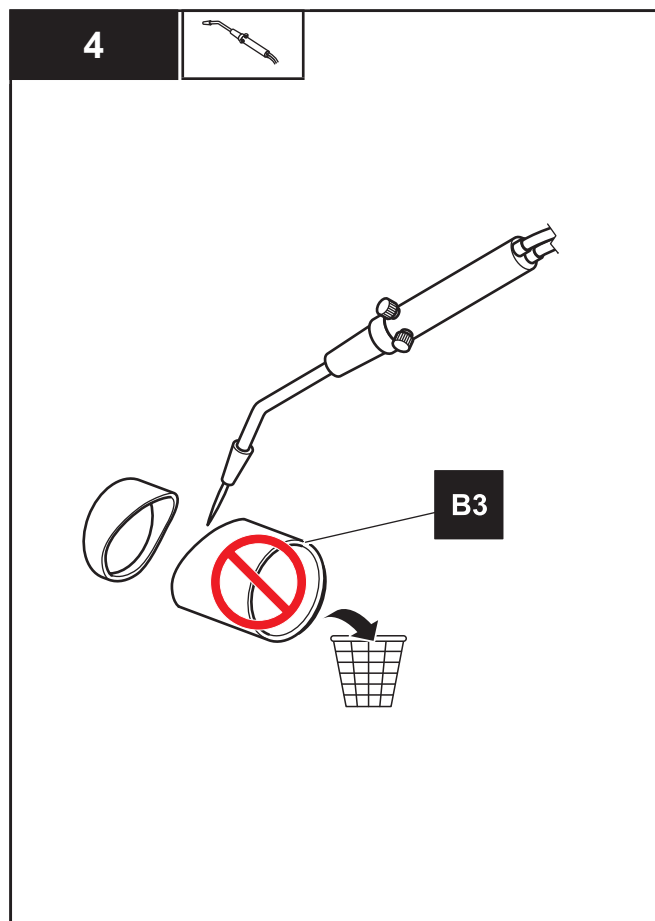
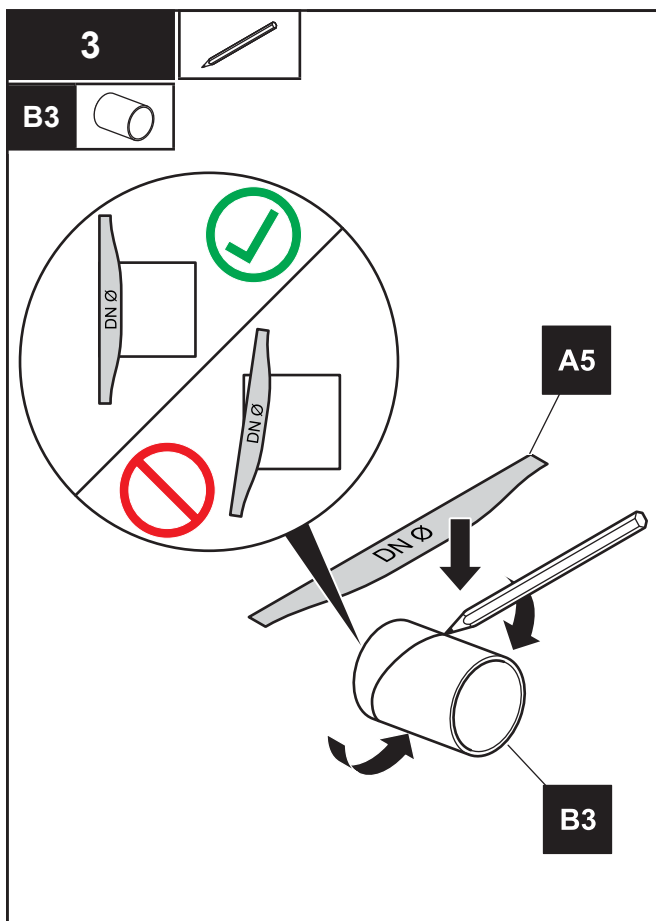
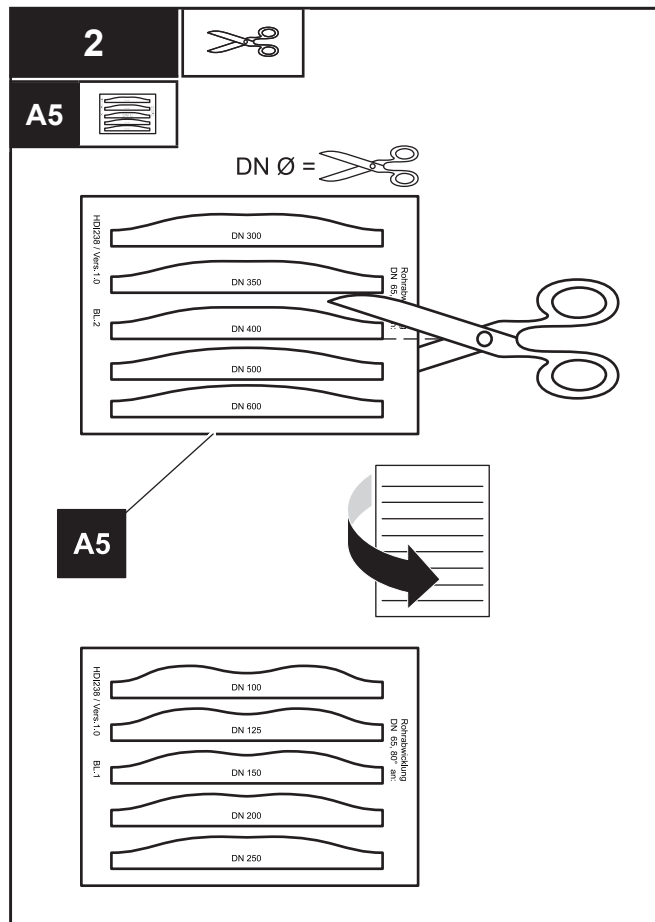
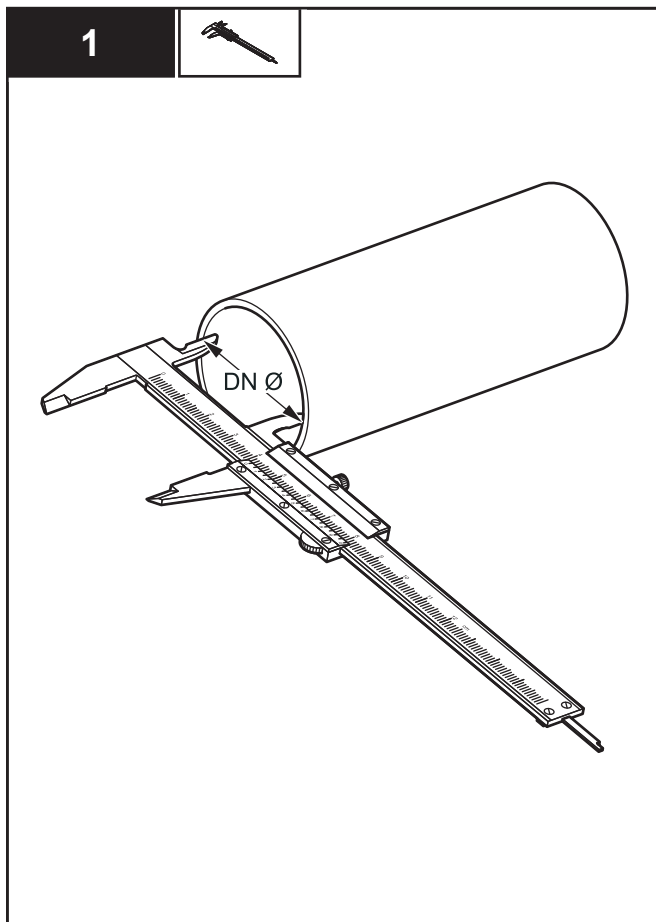
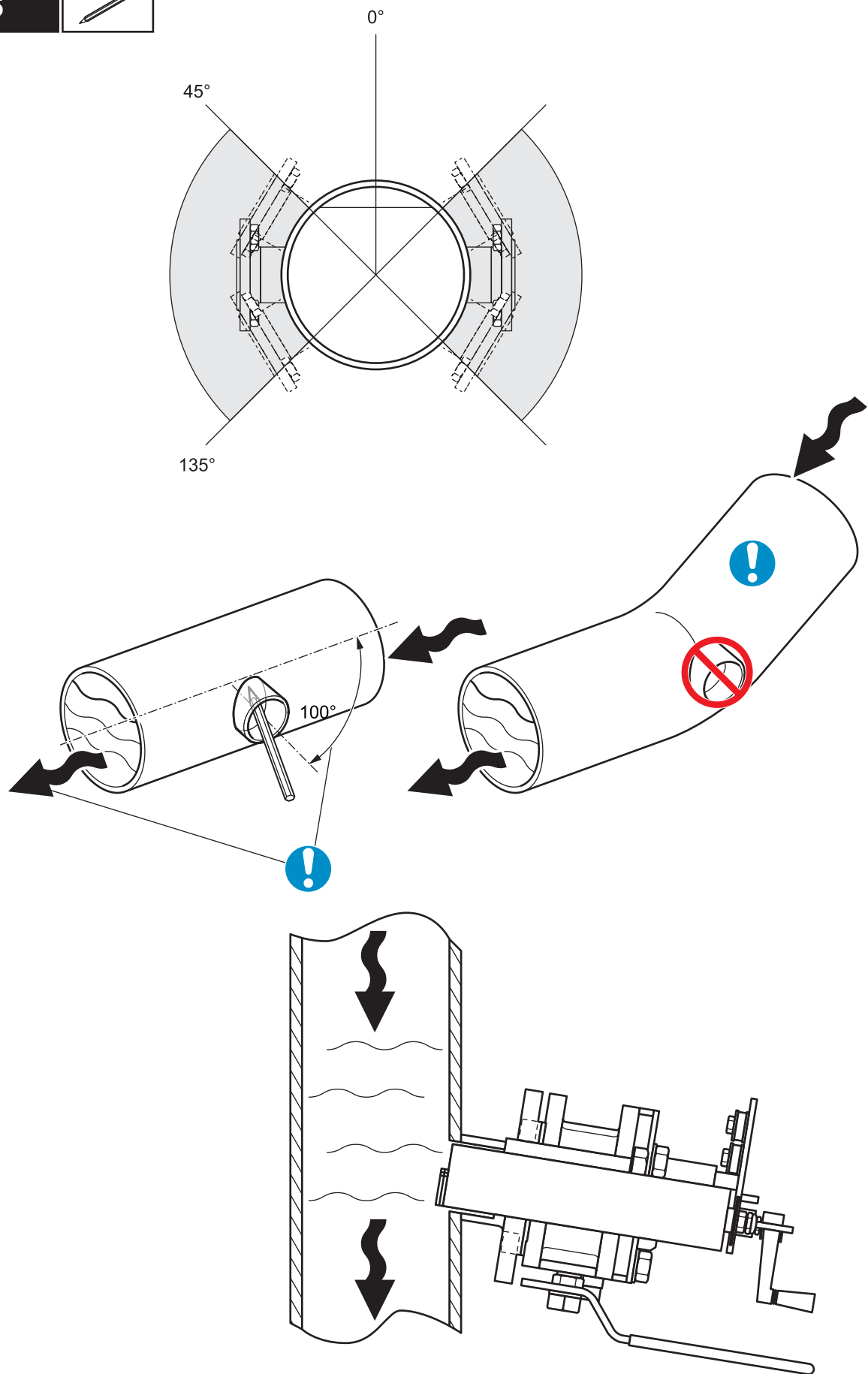
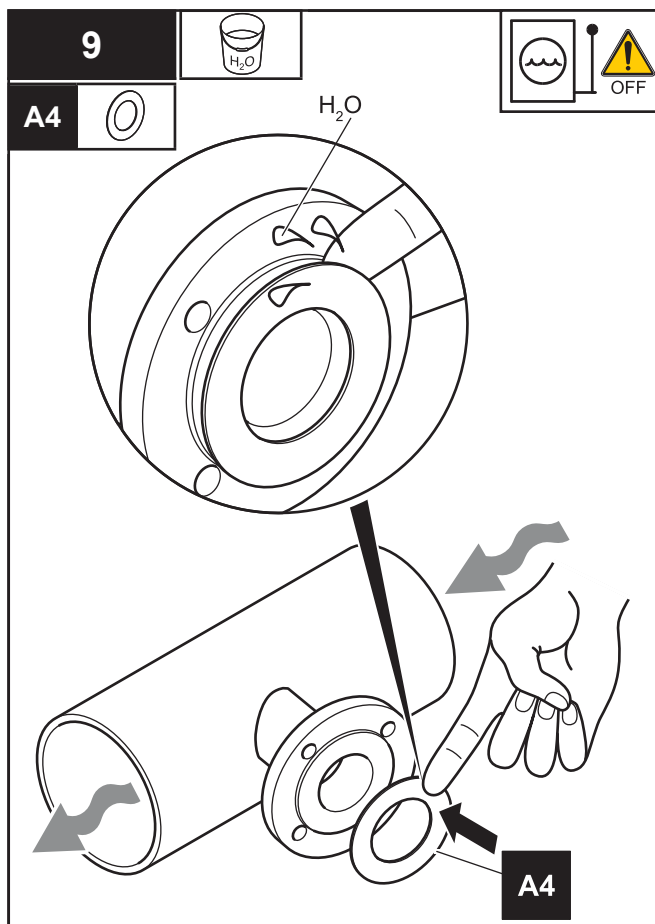
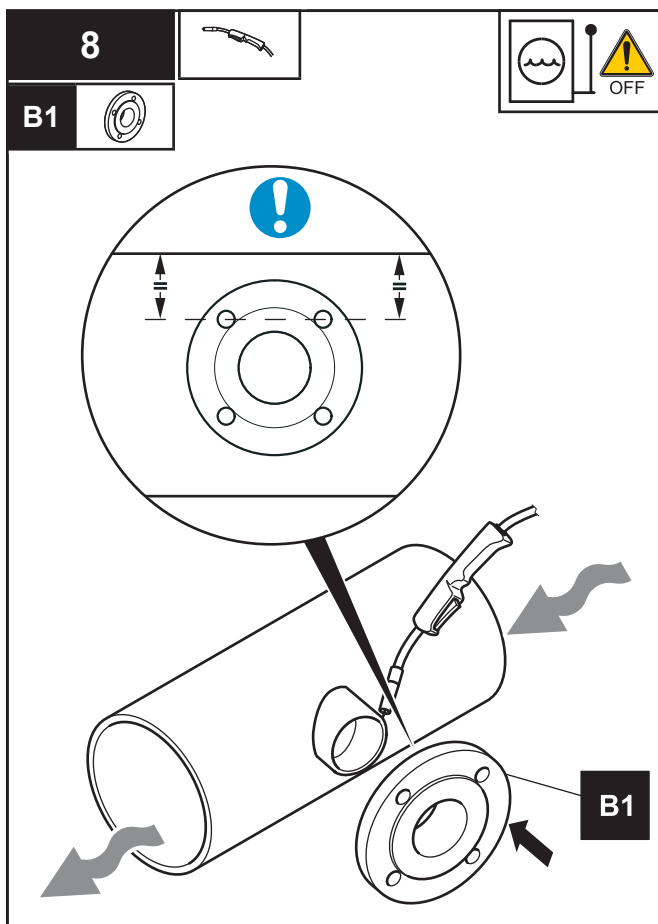
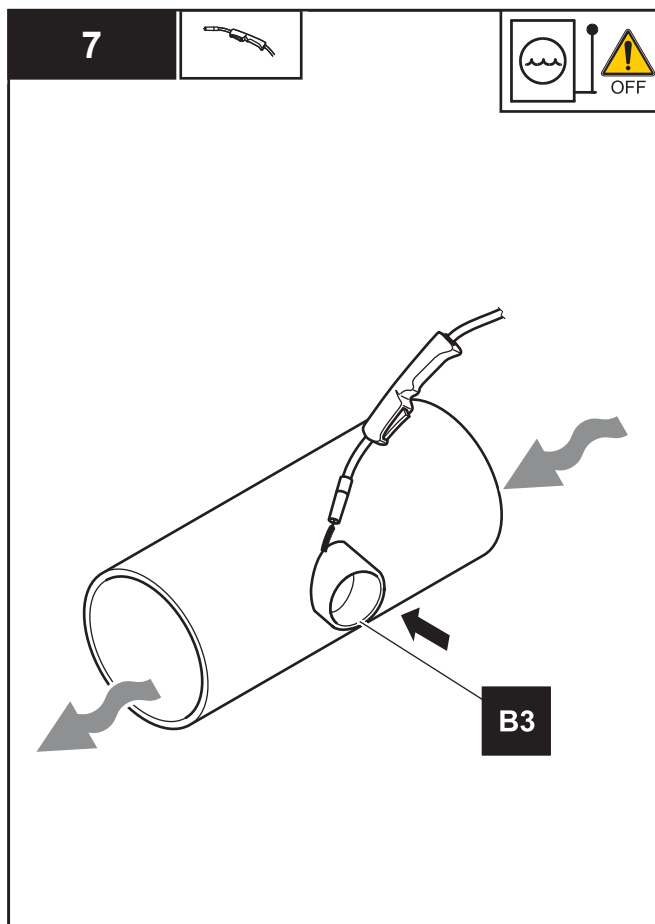
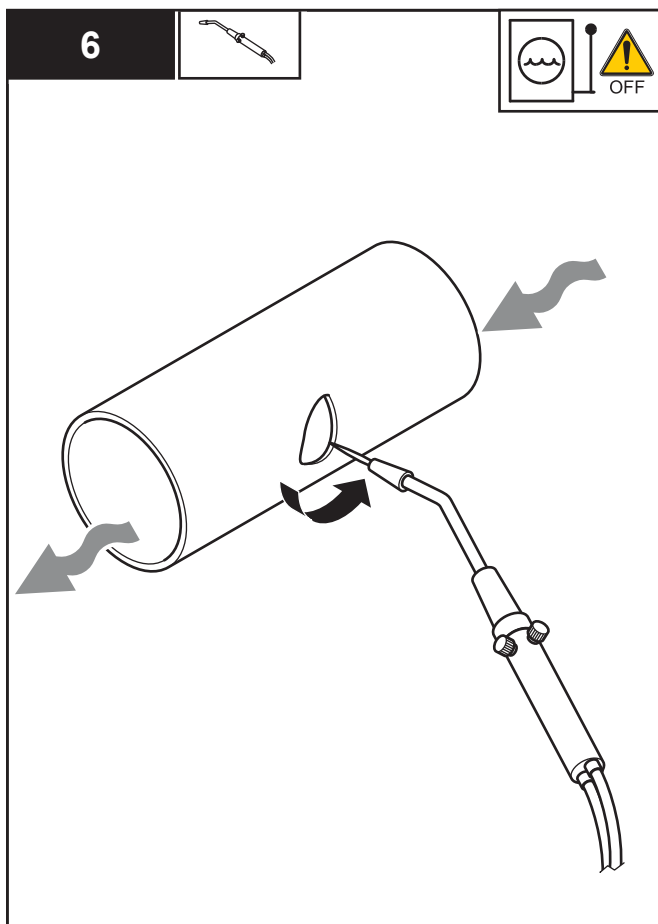
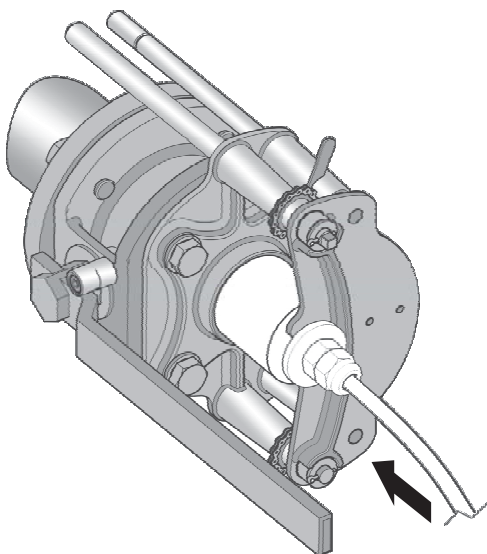


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	SOLITAX highline sc		1x		1x		4x		1x		1x		1x	







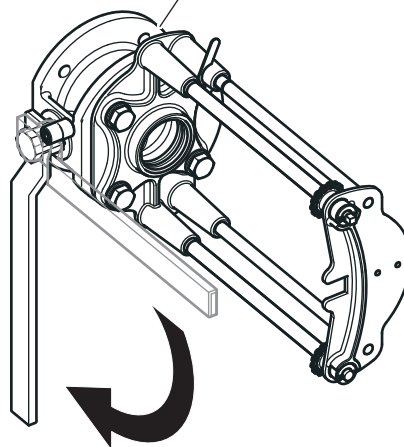


10

A1



A1



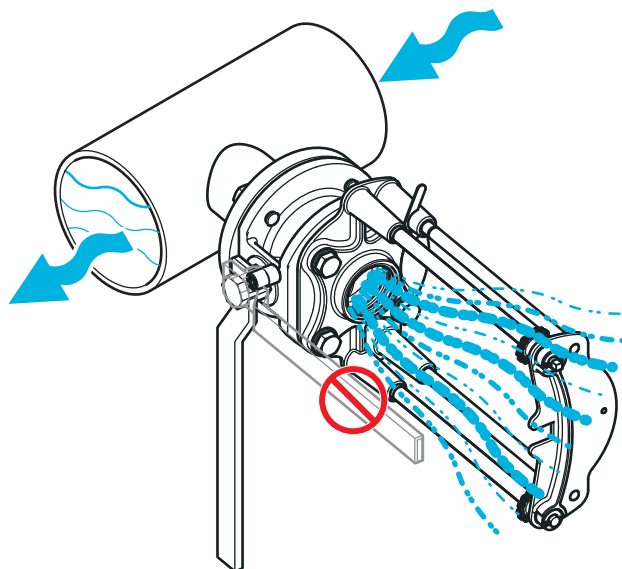
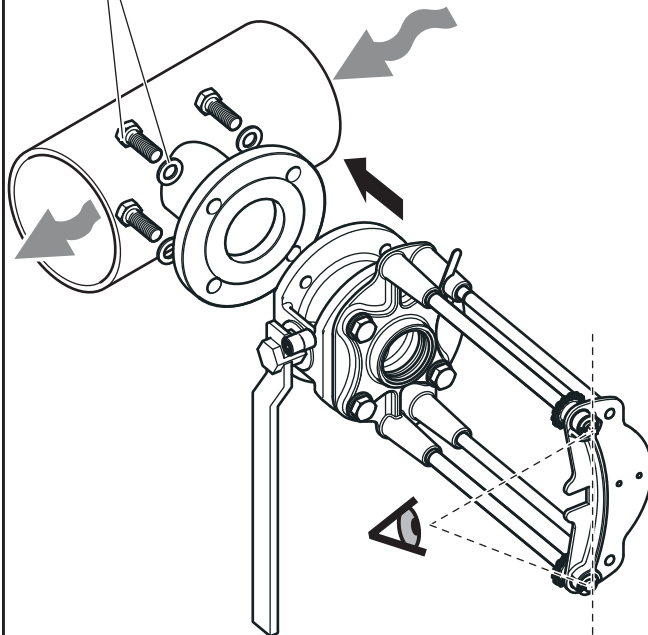
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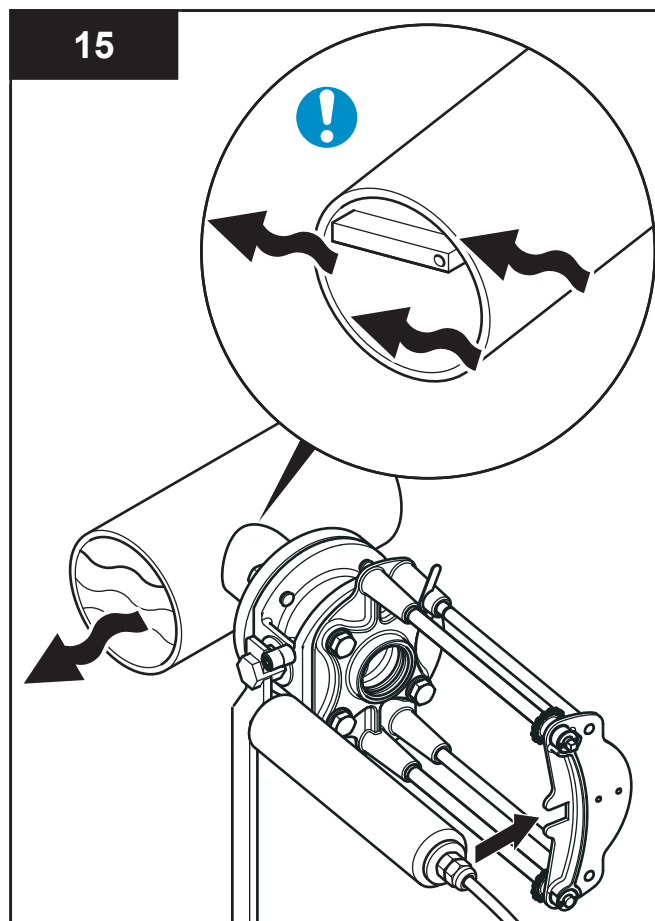
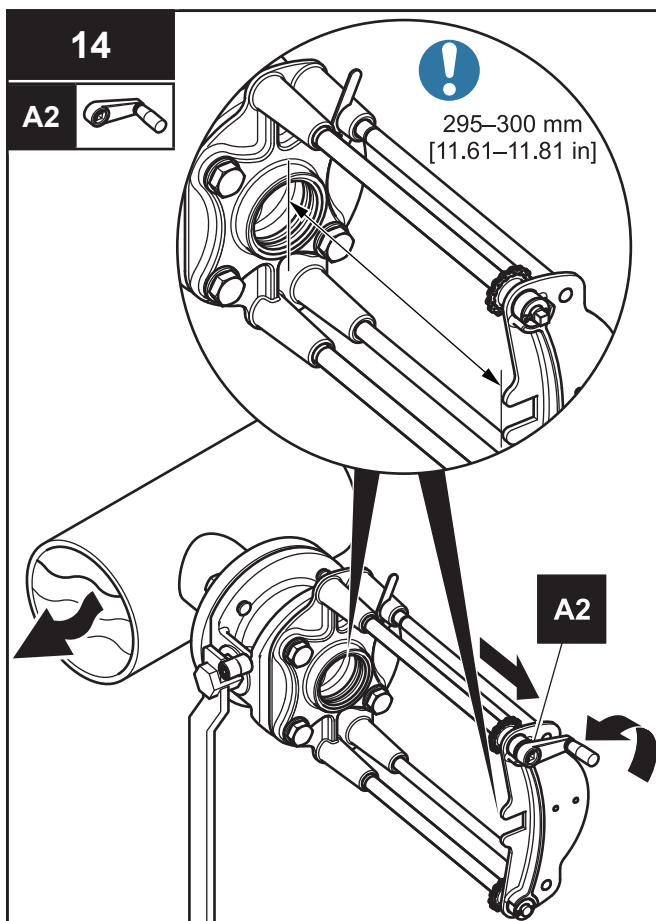
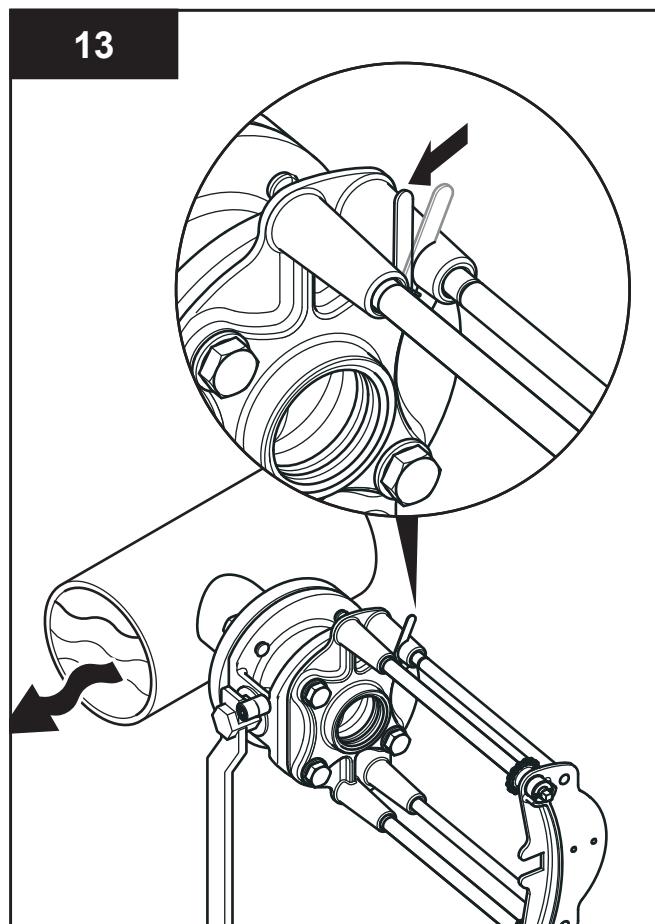
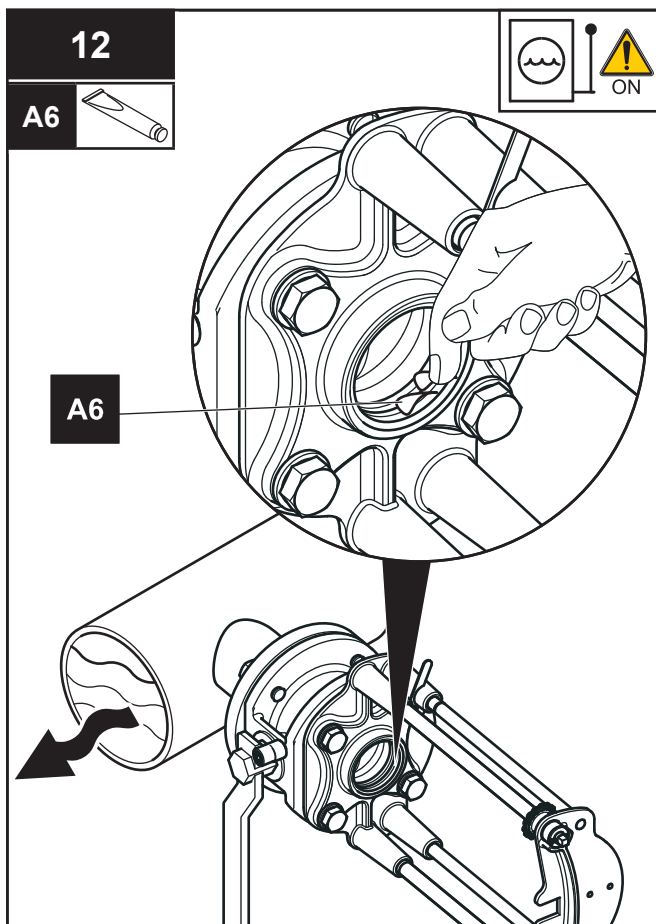
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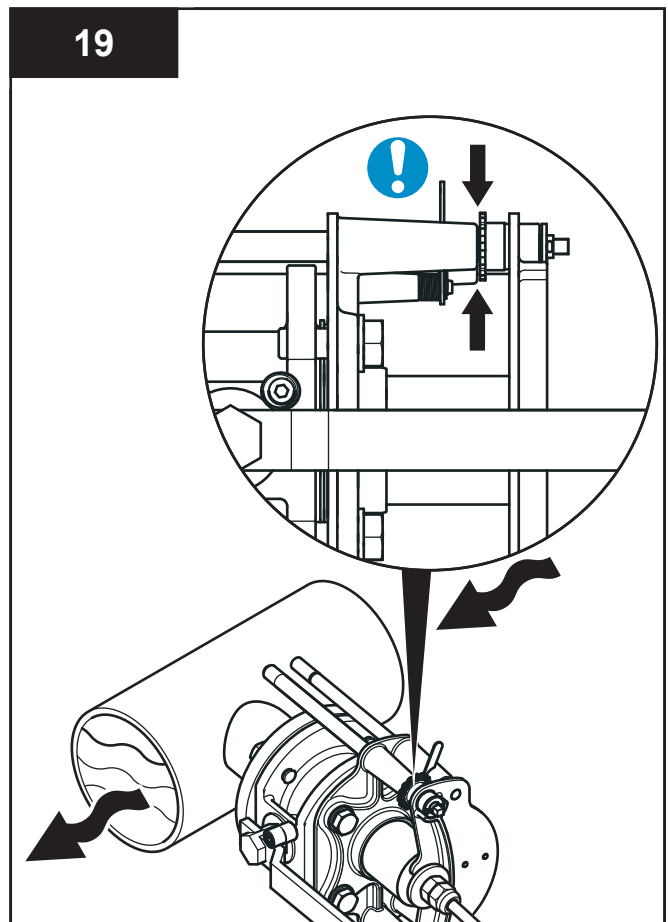
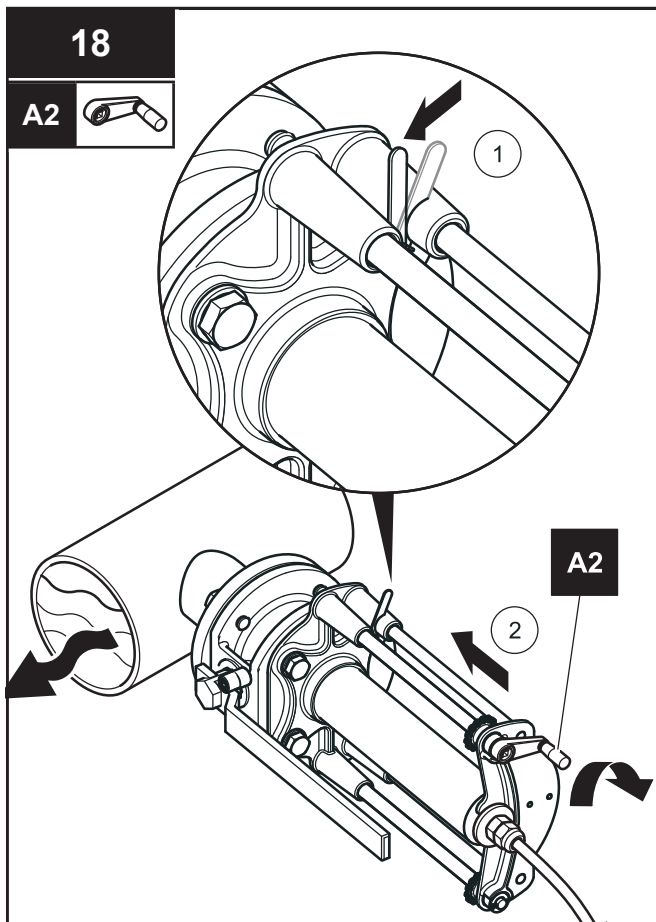
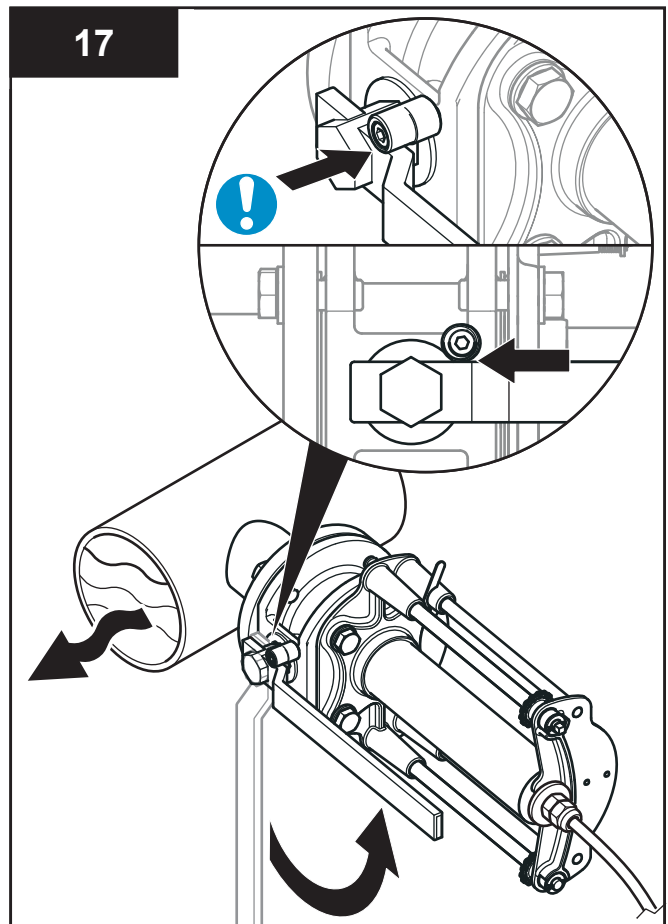
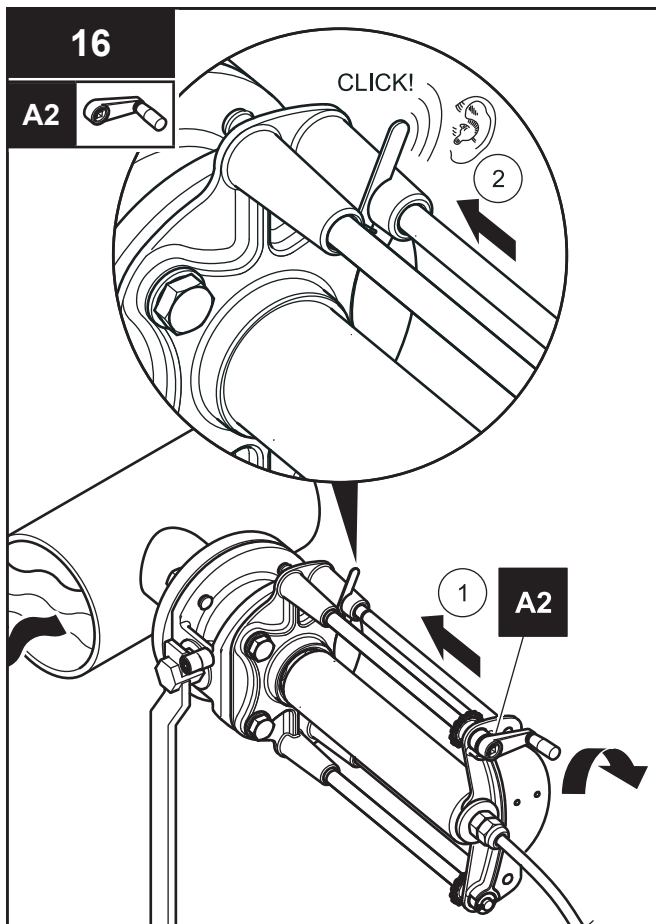
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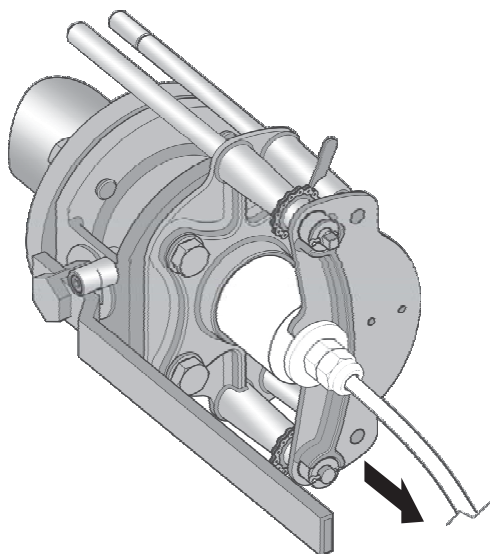
4x

A3









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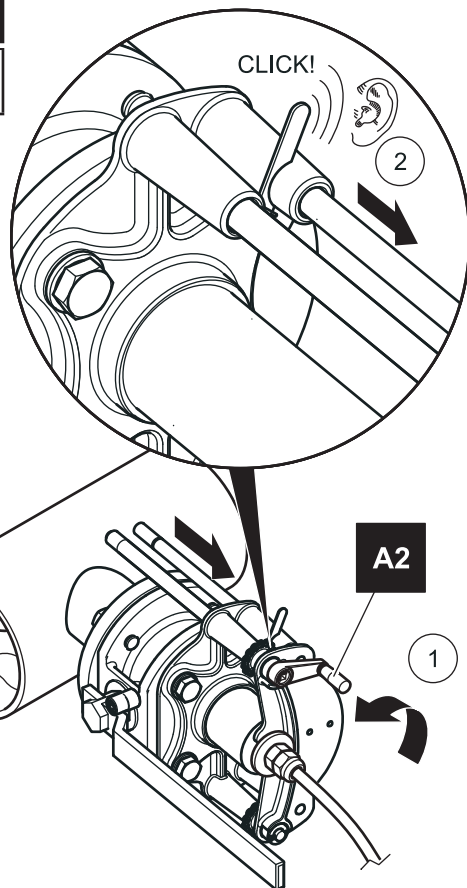
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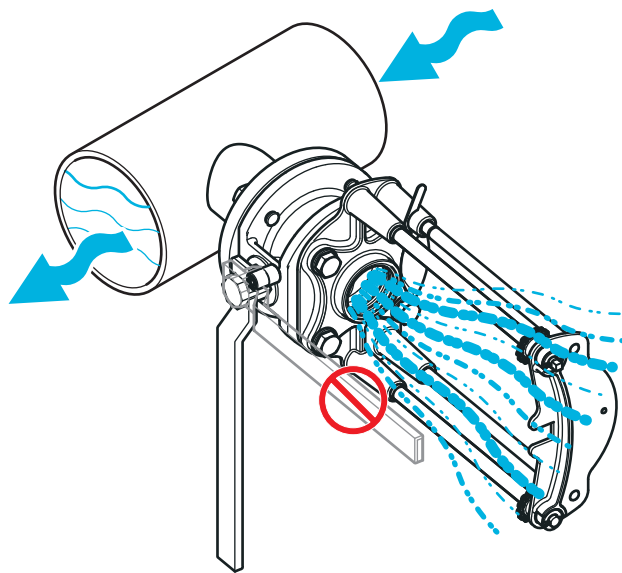
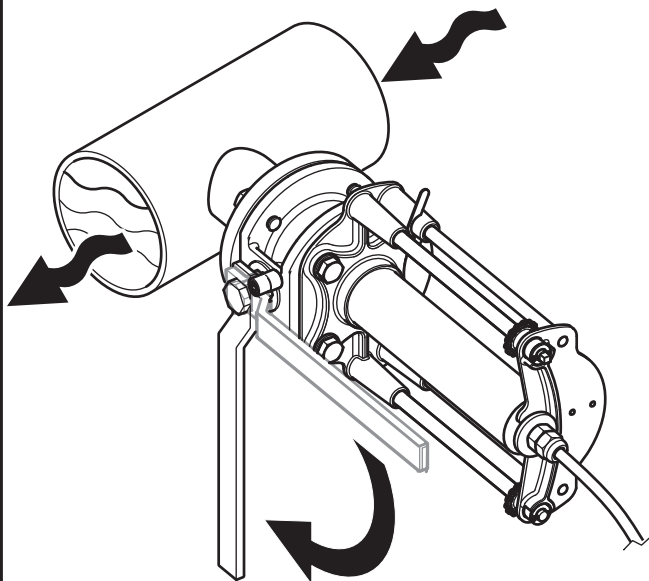
CLICK!

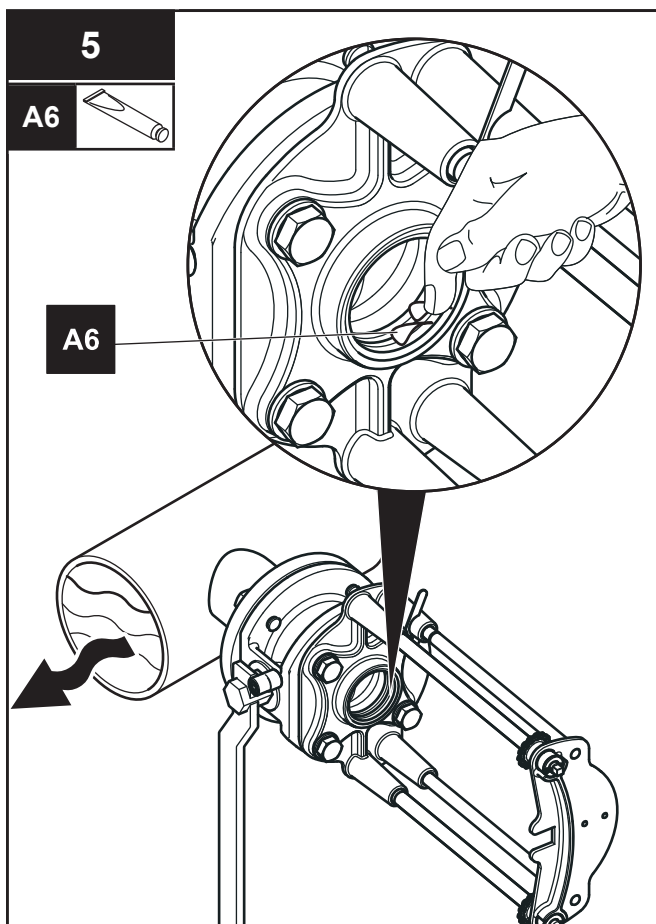
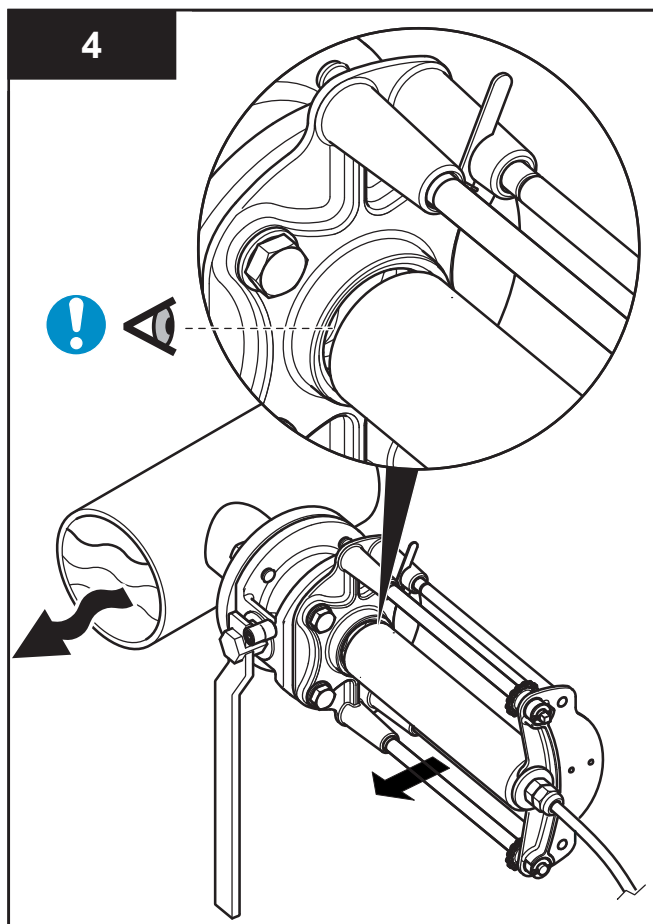
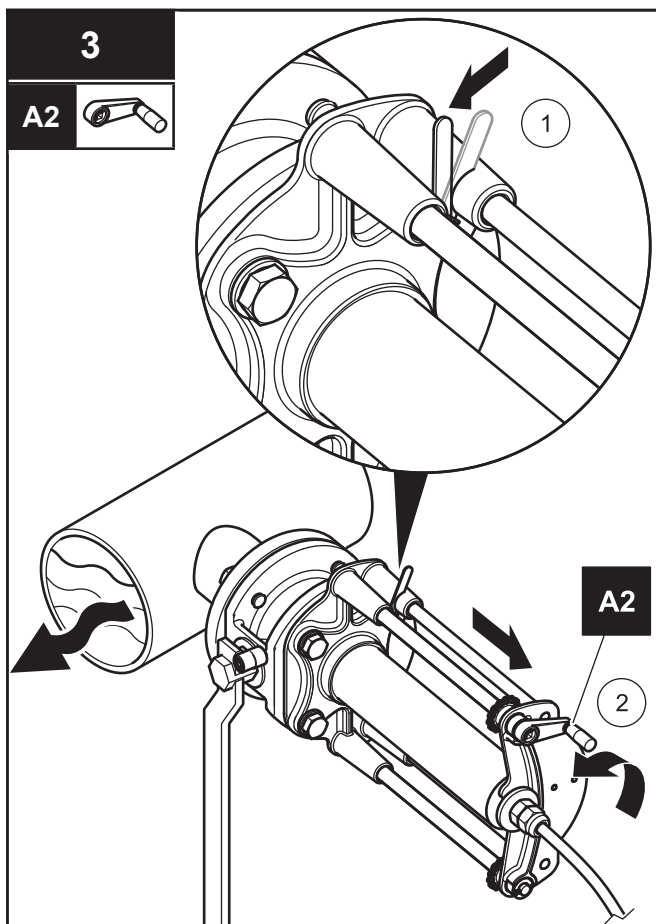
A2

1



2





[illegible]

[illegible]

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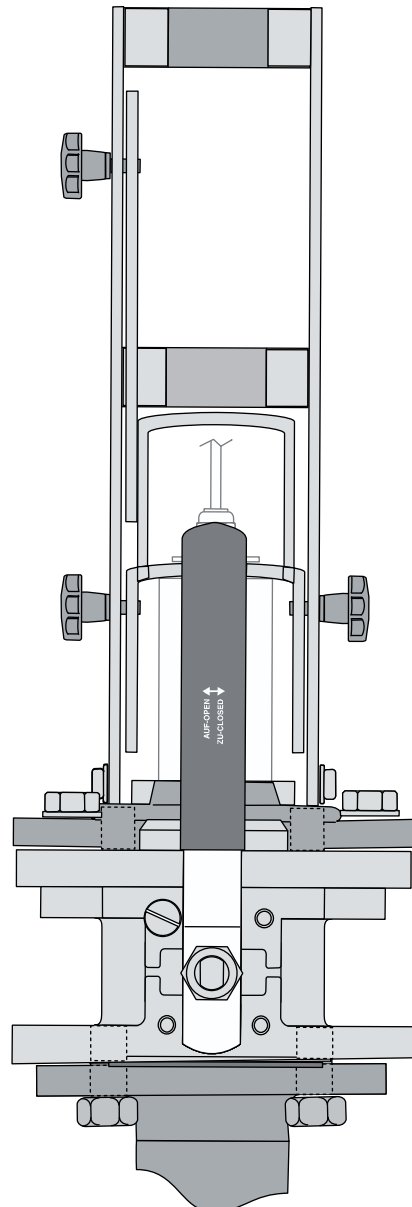
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LZX936

LZX660

LZX661

DOC273.99.90413/4



BG Преди инсталацията/монтажа на продукта, прочетете внимателно всички инструкции за инсталация и ги спазвайте по време на инсталацията. Инсталацията трябва да се извършва от квалифициран специалист в съответствие с местните разпоредби за безопасност. Погрижете се избраното място на инсталацията да гарантира безопасна инсталация и експлоатация. Продуктът е предназначен единствено за придържане/прикрепване на измервателните сензори/продукти на HACH/HACH LANGE. Всяко друго приложение може да носи риск за потребителя. Работите по поддръжката и ремонта трябва да се извършват изключително от оторизирания отдел за обслужване на клиенти. Могат да се използват само оригинални резервни части и препоръчани от производителя принадлежности. Всякакви изменения по продукта водят до анулиране на всички отговорности от страна на производителя. Неспазването на инструкциите за употреба или използването на продукта за цели, различни от тези, за които е предназначен, може да доведе до сериозно нараняване на потребителя и/или повреда на оборудването. Работата по заваряване, трябва да бъде извършвана само от квалифицирани заварчици съгласно DIN/EN 287 или от сертифицирани фирми по EN 3834-2.

CS Při instalaci/montáži produktu si pečlivě přečtěte všechny pokyny k instalaci a v průběhu instalace tyto pokyny dodržujte. Instalaci musí provádět kvalifikovaný odborník v souladu s místními bezpečnostními předpisy. Pečlivě vyberte umístění pro instalaci, které zajistí bezpečnou instalaci a provoz. Produkt je určen pouze k upevnění/přichycení měřičích snímačů/produktů HACH/HACH LANGE. Jakékoli jiné použití může znamenat riziko pro uživatele. Údržbu a opravy smí provádět výhradně autorizované oddělení zákaznických služeb. Je dovoleno používat pouze originální náhradní díly a příslušenství doporučené výrobcem. Jakékoli změny provedené na produktu způsobí neplatnost veškerých záruk. Nedodržení těchto pokynů nebo používání produktu pro jiný účel než pro který je určen může způsobit uživateli vážné zranění anebo poškodit zařízení. Potřebné svařecké práce musí být provedeny kvalifikovaným svařčem výhradně podle DIN/EN 287 nebo dodavatelem v souladu s EN 3834-2.

DA Før du installerer/monterer produktet, skal du læse alle installationsinstruktionerne grundigt og følge dem under installationen. Installationen skal udføres af en kvalificeret ekspert i overensstemmelse med alle lokale sikkerhedsbestemmelser. Vælg sikker og betjeningsvenligt placering til installationen. Produktet er kun beregnet til at holde/fastgøre HACH/HACH LANGE-målesensorer/-produkter. Enhver anden form for brug kan medføre skadesrisiko for brugeren. Vedligeholdelse og reparation bør kun udføres af en autoriseret kundeserviceafdeling. Der må kun anvendes originale reservedele og tilbehør, der er anbefalet af producenten. Alle ændringer af produktet ophever garantien. Hvis du ikke følger disse instruktioner eller bruger produktet til et andet formål, end det er beregnet til, kan der forekomme alvorlige personskader og/eller skader på udstyret. Svejsearbejde må kun udføres af DIN/EN 287 kvalificerede svejsere, eller EN 3834-2 certificerede firmaer.

DE Die Montageanleitung ist vor der Installation/Montage des Produktes sorgfältig und vollständig zu lesen und zu befolgen. Die Installation muss von einer Fachkraft (qualifiziertes Personal) unter Einhaltung aller lokal gültigen Sicherheitsvorschriften erfolgen. Der Montageort ist so zu wählen, dass eine sichere Installation und der sichere Betrieb gewährleistet ist. Die Verwendung des Produktes ist ausschließlich zum Halten/Befestigen von HACH/HACH LANGE Messsonden/Produkten vorgesehen. Jede andere Benutzung ist mit Risiken für den Benutzer verbunden. Wartungs- und Reparaturarbeiten sollten nur vom autorisierten Kundendienst durchgeführt werden. Es dürfen nur vom Hersteller empfohlene Originalersatz- und Zubehörteile verwendet werden. Änderungen am Produkt haben den Verlust jeglicher Haftungsansprüche zur Folge. Nichtbeachtung dieser Anweisungen oder eine andere Verwendung des Produktes kann schwerwiegende Verletzungen der Anwender oder Beschädigung am Gerät zur Folge haben. Die notwendigen Schweißarbeiten dürfen ausschließlich von entsprechend DIN/EN 287 qualifizierten Schweißern durchgeführt werden, oder von Fachfirmen entsprechend EN 3834-2.

EL Πριν από την εγκατάσταση/τοποθέτηση του προϊόντος, διαβάστε προσεκτικά και ακολούθηστε όλες τις οδηγίες εγκατάστασης κατά την εγκατάσταση. Η εγκατάσταση πρέπει να πραγματοποιηθεί από κατάλληλα εκπαιδευμένο τεχνικό και σύμφωνα με όλους τους τοπικούς κανονισμούς ασφαλείας. Επιλέξτε μια θέση τοποθέτησης που θα διασφαλίσει την ασφαλή εγκατάσταση και λειτουργία. Το προϊόν προορίζεται αποκλειστικά για τη στήριξη/σύνδεση των αισθητήρων μέτρησης/προϊόντων HACH/HACH LANGE. Οποιαδήποτε άλλη χρήση ενδέχεται να ενέχει κινδύνους για τον χρήστη. Οι εργασίες συντήρησης και επισκευής θα πρέπει να εκτελούνται αποκλειστικά από το εξουσιοδοτημένο τμήμα εξυπηρέτησης πελατών. Επιτρέπεται η χρήση μόνον των γνήσιων ανταλλακτικών και των αξεσουάρ που συνιστά ο κατασκευαστής. Οποιοσδήποτε αλλαγές στο προϊόν ακυρώνουν την ευθύνη της εταιρείας. Σε περίπτωση που δεν τηρηθούν αυτές τις οδηγίες ή χρησιμοποιηθούν το προϊόν για διαφορετικό σκοπό από αυτόν που προορίζεται, ενδέχεται να προκληθεί σοβαρός τραυματισμός στον χειριστή και/ή βλάβη στον εξοπλισμό. Οι απαιτούμενες εργασίες συγκόλλησης θα πρέπει να διεξάγονται από εξειδικευμένο προσωπικό σύμφωνα με DIN / EN287 ή από κατασκευαστικές εταιρείες σύμφωνα με DIN 3834-2.

EN Before installing/mounting the product, read all the installation instructions carefully and follow the instructions during installation. Installation must be carried out by a qualified expert in accordance with all local safety regulations. Take care to choose an installation location that will ensure safe installation and operation. The product is intended solely for holding/attaching HACH/HACH LANGE measuring sensors/products. Any other use may involve risks for the user. Maintenance and repair work should be carried out exclusively by the authorized customer service department. Only original replacement and accessory parts recommended by the manufacturer may be used. Any changes made to the product will nullify all liability. Failure to follow these instructions or use of the product for a purpose other than that for which it was intended may result in serious injury to the user and/or damage to the equipment. The required welding work must be performed exclusively in accordance with DIN / EN 287 qualified welders, or from contractors in accordance with EN 3834-2.

ES Antes de instalar o fijar el producto, lea con atención todas las instrucciones de instalación y sigalas durante el montaje. La instalación debe llevarla a cabo un experto cualificado, de acuerdo con las normas de seguridad locales. Elija una ubicación para la instalación que garantice que ésta y el funcionamiento del producto sean seguros. El producto sólo está diseñado para sujetar o fijar sensores o productos de medición de HACH/HACH LANGE. Cualquier otro uso puede conllevar riesgos para el usuario. El trabajo de mantenimiento y reparación sólo debe llevarse a cabo por el departamento de atención al cliente autorizado. Sólo deben utilizarse las piezas de repuesto recomendadas por el fabricante. Cualquier cambio que se realice en el producto anulará toda responsabilidad. Si no se siguen estas instrucciones o si se utiliza el producto para un uso distinto del uso para el que fue diseñado, el usuario puede sufrir heridas graves y/o se puede dañar el equipo. Los trabajos de soldadura requeridos deben ser realizados exclusivamente por soldadores cualificados según DIN / EN 287, o por contratistas de acuerdo a EN 3834-2.

FI Ennen kuin asennat/kiinnität tuotteen, lue kaikki asennusohjeet huolellisesti ja noudata niitä. Tuotteen saa asentaa vain valtuutettu henkilö, ja asennuksessa on noudatettava kaikkia paikallisia turvallisuusmääräyksiä. Asenna tuote sellaiseen paikkaan, johon asentaminen on turvallista ja jossa tuote toimii oikein. Tuote on tarkoitettu ainoastaan HACH/HACH LANGE -mittausanturien/-tuotteiden ripustamiseen/kiinnittämiseen. Muulainen käyttö voi aiheuttaa vaaratilanteita käyttäjälle. Huolto- ja korjaustyöt saa tehdä vain valtuutettu asiakaspalveluosasto. Tuotteessa saa käyttää vain valmistajan suosittelemaa alkuperäisiä vara-

ja lisäosia. Tuotteeseen tehdyt muutokset mitätöivät kaikki vastuut. Jos näitä ohjeita ei noudateta tai jos tuotetta käytetään johonkin muuhun kuin sen varsinaiseen käyttötarkoitukseen, käyttäjälle voi aiheutua vakavia vammoja ja/tai laite voi vaurioitua. Vain DIN / EN 287 mukaan hyväksytyt hitsaajat tai EN 3834-2 mukaiset urakoitsijat saavat tehdä vaaditut hitsaukset.

FR Avant l'installation/le montage du produit, lisez attentivement toutes les instructions d'installation et suivez-les au cours de l'installation. L'installation doit être réalisée par un expert qualifié conformément à toutes les réglementations de sécurité locales. Veillez à choisir un emplacement permettant d'assurer une installation et un fonctionnement en toute sécurité. Ce produit est uniquement destiné à maintenir/fixer des capteurs/équipements de mesure HACH LANGE. Toute autre utilisation entraînerait un risque pour l'utilisateur. Seul le service clientèle agréé est autorisé à effectuer les travaux de maintenance et de réparation. Seuls les pièces de rechange et les accessoires d'origine recommandés par le fabricant doivent être utilisés. La modification du produit annule toute responsabilité. Le non-respect de ces instructions ou l'utilisation de ce produit à des fins autres que celles auxquelles il est destiné risqueraient de gravement blesser l'utilisateur et/ou d'endommager le matériel. Le travail de soudure requis doit être réalisé exclusivement par des soudeurs qualifiés en conformité avec DIN / EN 287, ou par prestataires conformément à EN 3834-2.

HR Prije instalacije/postavljanja uređaja, pažljivo pročitajte sve upute za montažu i pratite ih tijekom postupka instalacije. Instalaciju mora provesti kvalificirani stručnjak u skladu s lokalnim sigurnosnim propisima. Brižljivo odaberite mjesto instalacije na kojem će se postavljanje uređaja i njegovo korištenje odvijati u sigurnim uvjetima. Uređaj je namijenjen isključivo za držanje/pričvršćivanje HACH/HACH LANGE mjernih senzora/uređaja. Upotreba uređaja u druge svrhe može predstavljati rizik za korisnika. Održavanje i popravke smije provoditi isključivo ovlašteni servisni odjel. Mogu se upotrebljavati samo originalni rezervni i dodatni dijelovi koje je preporučio proizvođač. Bilo kakve izmjene izvršene na uređaju poništiti će njegovu pouzdanost. Nepoštivanje ovih uputa ili upotreba uređaja za svrhe za koje nije namijenjen mogu dovesti do ozbiljnih ozljeda osoba koje se njime koriste i/ili štete na opremi. Potreban posao za zavarivanje mora biti izveden prema DIN / EN 287 od strane kvalificiranih varoica ili izvođača radova prema EN 3834-2.

HU A termék üzembe helyezésére/rögzítésre előtt tekintse át a vonatkozó utasításokat, és tartsa is be azokat. Az üzembe helyezést kizárólag szakember végezheti, a hatályos biztonsági előírásoknak megfelelően. A telepítéshez biztonságos üzemet szavatoló helyet válasszon. A termék kizárólag HACH/HACH LANGE mérőberendezések és készületek rögzítésére szolgál. Az ettől eltérő bármilyen használat kockázattal jár. A karbantartást és egyéb javításokat kizárólag az arra feljogosított ügyfélszolgálati részleg végezheti el. Csak a gyártó által ajánlott cserealkatrészek használhatóak. A terméken végzett bármilyen módosítás a felelősség kizárását vonja maga után. Az utasítások be nem tartása, a termék megadott felhasználási területétől eltérő célra való alkalmazása a kezelő súlyos sérülését és/vagy a berendezés károsodását okozhatja. A szükséges hegesztési munkákat csak DIN/EN 287 bizonyítvánnyal rendelkező hegesztő szakember, vagy EN 3834-2 minősítéssel rendelkező szakőég végezheti.

IT Prima di installare/montare il prodotto, leggere le istruzioni sull'installazione e attenersi scrupolosamente ad esse durante l'installazione. L'installazione deve essere eseguita da personale qualificato in base alle norme di sicurezza locali. Scegliere con cura il punto di installazione per un'installazione corretta e un funzionamento sicuro. Il prodotto è adatto esclusivamente per il sostegno/collegamento di prodotti/sensori di misura HACH/HACH LANGE. Qualsiasi altro utilizzo può provocare lesioni all'utente. La manutenzione e gli interventi di riparazione devono essere eseguiti esclusivamente dal reparto assistenza clienti. Il produttore consiglia di sostituire gli accessori solo con ricambi originali. Qualsiasi modifica apportata al prodotto prevede l'esclusione da qualsiasi responsabilità. La mancata osservanza della procedura di installazione o l'utilizzo inappropriato del prodotto possono provocare serie lesioni all'utente e/o danni all'apparecchiatura. Il lavoro di saldatura richiesto deve essere effettuato esclusivamente in accordo alla direttiva DIN / EN 287 da saldatori qualificati o da costruttori in accordo a EN 3834-2.

JA 製品を取り付ける前にすべての設置手順をよく読み、手順に従って設置してください。設置は地域の安全基準に従い、資格のある担当者が行ってください。設置場所は、安全に取り付けで操作できる場所を選んでください。本製品は、HACH/HACH LANGE 測定センサー/製品の保持および接続専用です。その他の用途には、ユーザーの責任において使用してください。メンテナンスおよび修理は、認定されたカスタマー サービス部門のみが実施できます。交換部品および付属品には、メーカー推奨の純正品のみを使用してください。製品を改変した場合、保証は無効になります。手順に従わなかった場合、または製品を用途外に使用した場合は、置傷を負ったり、装置が破壊することがあります。フルディングはDIN/EN287に基づいて認定された作業業者あるいはEN3834-2に基づく受託業者が実施する。

KO 본 제품을 설치하거나 장착하기 전에 모든 설치 지침을 충분히 검토하고 설치 시 반드시 해당 지침을 따르십시오. 설치는 숙련된 기술자가 지역의 모든 관련 안전 규정을 준수하여 수행해야 합니다. 설치 및 작동 시 안전한 장소를 신중하게 고려하십시오. 본 제품은 HACH/HACH LANGE 측정 센서 또는 측정 제품을 지지하거나 연결하는 용도로만 사용됩니다. 그 외 다른 용도로 사용 시 작업자가 위험할 수 있습니다. 유지 관리 및 보수 작업은 공인된 고객 서비스 부서에서 전적으로 담당해야 합니다. 제조사가 승인한 교체용 부품 및 주변 장치만 사용 가능합니다. 제품 변경으로 인한 책임은 지지 않습니다. 이러한 지침에 어긋나거나 원래 제품의 용도와, 본 목적으로 사용할 경우 작업자에게 심각한 부상이 일어나거나 장비가 손상될 수 있습니다. 용접 작업이 필요한 경우에는 반드시 DIN/EN 287 자격을 가진 용접공이나 EN3834-2에 상응한 사람에 의해서 반드시 수행되어야 합니다.

NL Lees vóór montage van het product alle montage-instructies grondig door en volg de instructies tijdens de montage op. Montage dient te worden uitgevoerd door een gekwalificeerde persoon en in overeenstemming met alle plaatselijke veiligheidsvoorschriften. Kies een montagelocatie die een veilige montage en werking garandeert. Het product is uitsluitend bedoeld voor opname/bevestiging van meetsensoren/-producten van HACH/HACH LANGE. Elk ander gebruik kan gevaren voor de gebruiker met zich meebrengen. Onderhoud en reparatie mogen uitsluitend worden uitgevoerd door de geautoriseerde afdeling klantenservice. Er mogen alleen originele, door de fabrikant aanbevolen reservedelen en accessoires worden gebruikt. Bij elke aanpassing van het product vervalt de aansprakelijkheid. Als u deze instructies niet opvolgt of als u het product voor een ander doel gebruikt dan waarvoor het is bedoeld, kan dit leiden tot ernstig letsel van de gebruiker en/of beschadiging van de apparatuur. Het benodigde laswerk mag uitsluitend uitgevoerd worden door DIN/EN287 gekwalificeerde lassers, of door EN3834-2 gecertificeerde installateurs.

PL Przed zainstalowaniem/zamontowaniem produktu, uważnie przeczytać wszystkie instrukcje i postępować zgodnie z ich zaleceniami podczas instalacji. Instalacja powinna zostać wykonana przez specjalistę o odpowiednim kwalifikacjach, zgodnie ze wszystkimi obowiązującymi lokalnie przepisami bezpieczeństwa. Wybrać takie miejsce instalacji, które zapewni bezpieczeństwo podczas instalacji i użytkowania. Produkt jest przeznaczony wyłącznie do zamocowania/zawieszenia czujników/mierników firmy HACH/HACH LANGE. Jakiegokolwiek inne zastosowanie niesie ze sobą ryzyko dla użytkownika. Konserwacje i naprawy powinny być przeprowadzane wyłącznie przez upoważnioną personel działu serwisowego klienta. Wolno używać tylko oryginalnych części zamiennych i części wyposażenia zalecanych przez producenta. Jakiegokolwiek modyfikacje w budowie i działaniu produktu uznają wygaśnięcie

gwarancji i wykluczają wszelką odpowiedzialność producenta. Nieprzestrzeganie tych instrukcji lub używanie produktu do celów innych niż wynika z opisu jego przeznaczenia, może być przyczyną poważnych wypadków z udziałem użytkownika i/lub uszkodzenia sprzętu. Wymagane prace spawalnicze muszą być wykonane zgodnie z normą DIN / EN 287 przez wykwalifikowany personel lub przez firmy pośredniczące zgodnie z EN3834-2.

PT Antes de instalar/montar o produto, leia atentamente as instruções de instalação e siga-as durante a instalação. A instalação deve ser efectuada por um profissional qualificado em conformidade com todas as regulamentações locais de segurança. Escolha cuidadosamente o local de instalação de modo a assegurar uma operação e instalação com segurança. Este produto foi concebido apenas para segurar/fixar sensores/produzidos para medições da HACH/HACH LANGE. Qualquer outro tipo de utilização pode implicar riscos para o utilizador. O trabalho de manutenção e reparação deve ser efectuado única e exclusivamente pelo departamento de assistência ao cliente devidamente autorizado. Apenas podem ser utilizados acessórios e peças de substituição originais recomendados pelo fabricante. Qualquer alteração feita ao produto anula toda a responsabilidade da nossa parte. O não cumprimento das instruções ou a utilização do produto para outros fins que não aqueles para que o produto foi concebido pode resultar em ferimentos graves e/ou danos ao equipamento. O trabalho de soldadura exigido deverá ser executado exclusivamente por soldadores qualificados de acordo com a norma DIN / EN 287, ou por empreiteiros em conformidade com a norma EN 3834-2.

RO Înainte de instalarea/montarea produsului, citiți cu atenție toate instrucțiunile de instalare și urmați instrucțiunile în timpul instalării. Instalarea trebuie realizată de un expert calificat în conformitate cu toate reglementările locale pentru siguranță. Aveți grijă să alegeți o locație de instalare care să asigure instalarea și funcționarea în siguranță. Produsul este destinat exclusiv pentru menținerea/atașarea senzorilor/produșelor de măsurare HACH/HACH LANGE. Utilizarea în alte scopuri poate implica riscuri pentru utilizator. Întreținerea și lucrările de reparație trebuie realizate exclusiv de departamentul de service autorizat pentru clienți. Pot fi utilizate numai piesele de schimb și accesoriile originale recomandate de producător. Orice modificare adusă produsului va duce la anularea oricărei răspunderi. Nerespectarea acestor instrucțiuni sau utilizarea produsului în alte scopuri decât în cele destinate pot duce la accidente grave pentru utilizator și/sau defectarea echipamentului. Lucrările de sudură necesare trebuie să fie efectuate exclusiv de sudori calificați în conformitate cu DIN / EN 287, sau de contractori în conformitate cu EN 3834-2.

RU Перед установкой/монтажом изделия необходимо внимательно прочитать инструкции по установке и строго следовать им во время выполнения работ. Установка должна быть выполнена квалифицированным специалистом с соблюдением действующих правил по технике безопасности. Выбирая место для установки, необходимо учитывать требования по безопасности при монтаже и эксплуатации изделий. Данное изделие предназначено только для крепления измерительных датчиков/приборов компании HACH/HACH LANGE. Любое другое применение может представлять опасность для пользователя. Работы по ремонту и техобслуживанию должны выполняться исключительно специалистами уполномоченной сервисной организации. С изделием могут использоваться только запчасти и принадлежности, рекомендуемые изготовителем. Любые изменения, внесенные в конструкцию изделия, приведут к отмене гарантии поставщика. Несоблюдение требований инструкций или использование изделия не по назначению могут стать причиной серьезных травм для людей и/или повреждения оборудования. Необходимые сварочные работы должны проводиться только сварщиками, квалифицированными в соответствии с DIN / EN 287, или подрядчиками в соответствии с DIN 3834-2.

SK Pred inštaláciou/upevnením produktu si pozorne prečítajte všetky pokyny k inštalácii a počas inštalácie ich dodržujte. Inštaláciu musí vykonať kvalifikovaný expert v súlade so všetkými miestnymi bezpečnostnými nariadeniami. Uistite sa, že si vyberiete miesto inštalácie, ktoré zaručí bezpečnú inštaláciu a prevádzku. Produkt je určený výlučne pre uchytenie/upevnenie meracích snímačov/produktov HACH/HACH LANGE. Akékoľvek iné použitie môže zahŕňať riziká pre používateľa. Údržbu a opravy by malo vykonávať výlučne autorizované oddelenie služieb pre zákazníkov. Môžu sa použiť len originálne náhradné diely a príslušenstvo, ktoré odporúča výrobca. Akékoľvek zmeny vykonané na produkte spôsobia neplatnosť všetkej zodpovednosti. Nedodržanie týchto pokynov alebo používanie produktu na iný než určený účel môže spôsobiť vážne zranenie používateľa alebo poškodenie zariadenia. Požadované zváračské práce musia byť vykonané výhradne v súlade s DIN/EN 287 kvalifikovanými zváračmi, alebo dodávateľmi v súlade s EN 3834-2.

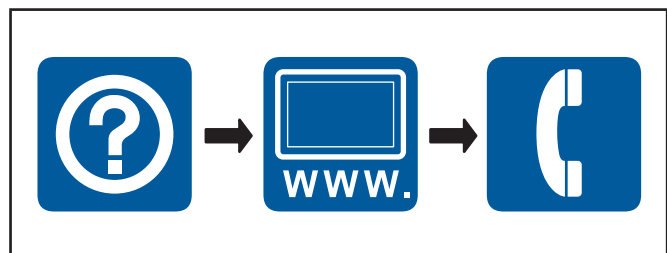
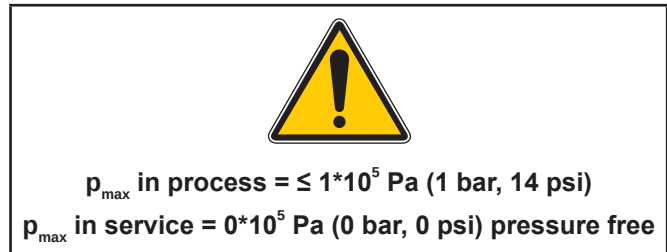
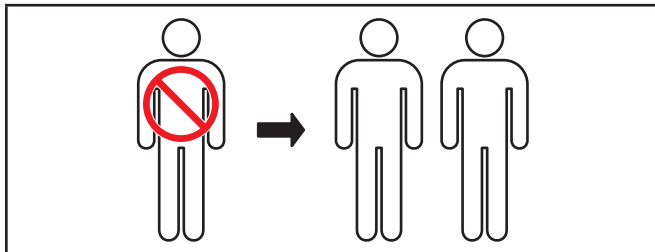
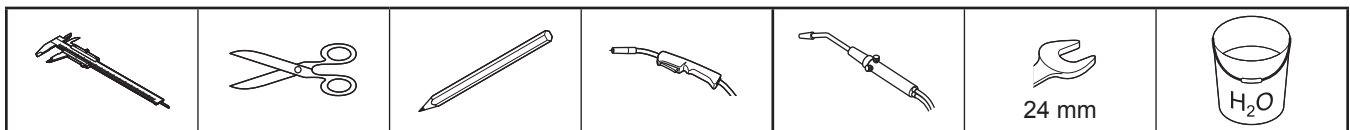
SL Pred namestitvijo/postavitvijo izdelka natančno preberite vsa navodila za namestitev in jih med nameščanjem upoštevajte. Namestitev mora izvesti usposobljen strokovnjak v skladu z vsemi lokalnimi varnostnimi predpisi. Za namestitev izberite mesto, ki zagotavlja varno namestitev in uporabo. Izdelek je namenjen izključno za namestitev/prireditve merilnih senzorjev/ izdelkov HACH/HACH LANGE. Vsakršna drugačna uporaba lahko predstavlja nevarnost za uporabnika. Vzdrževanje in popravilo lahko izvaja izključno osebje pooblaščenega servisnega oddelka. Uporabljajte lahko samo originalne nadomestne dele in dodatno opremo, ki jih priporoča proizvajalec. Spremembe izdelka razveljavijo vsakršno odgovornost. Če teh navodil ne upoštevate ali izdelek uporabljate v neprimeren namen, lahko pride do hudih poškodb uporabnika in/ ali poškodovanja opreme. Zahtevana dela varenja lahko izvajajo izključno usposobljeni varilci v skladu z DIN/EN 287 ali izvajalci v skladu z EN 3834-2.

SR Pre instalacije/montaže uređaja pažljivo pročitajte sva uputstva za montažu i pratite ih tokom postupka montaže. Instalaciju mora provesti kvalifikovani stručnjak u skladu sa lokalnim propisima o bezbednosti. Briljivo odaberite mesto instalacije na kom će se montaža uređaja i korišćenje odvijati u bezbednim uslovima. Uređaj je namenjen isključivo za držanje/pričvršćivanje HACH/HACH LANGE mernih senzora/uređaja. Upotreba uređaja u druge svrhe može da predstavlja rizik po korisnika. Održavanje i opravke sme da provodi isključivo ovlašćeni serviser. Kod zamene i opravaka smeju da se koriste samo originalni rezervni i dodatni delovi koje je preporučio proizvođač. Bilo kakve izmene izvršene na uređaju poništavaju njegovu pouzdanost. Nepridržavanje uputstava ili upotreba uređaja u svrhe za koje nije namenjen mogu dovesti do ozbiljnih povreda ljudi koji ga koriste i/ili štete na opremi. Neophodni radovi zavarivanja treba da budu izvršeni od strane zavarivača u skladu sa DIN / EN 287 ili od ugovorenog izvođača radova u skladu sa EN 3834-2.

SV Läs alla installationsanvisningar noggrant innan du installerar/monterar produkten och följ anvisningarna under installationen. Installationen måste utföras av en kvalificerad expert i enlighet med alla lokala säkerhetsföreskrifter. Se till att välja en installationsplats som garanterar säker installation och drift. Produkten är endast ämnad för att hålla/fästa mätensorer/-produkter från HACH/HACH LANGE. Annan användning kan medföra risker för användaren. Underhålls- och reparationsarbeten ska uteslutande utföras av den auktoriserade kundserviceavdelningen. Endast originalreservdelar och -tillbehör som rekommenderas av tillverkaren ska användas. Om någon ändring görs på produkten upphävs tillverkarens ansvar. Det kan det medföra allvariga skador för användaren eller skador på utrustningen om du inte följer anvisningarna eller om du använder produkten i installationer den inte är avsedd för. Svetsarbeten skall uteslutande utföras av svetsare kvalificerade enligt DIN/EN 287, eller av entreprenör enligt EN3834-2.

TR Ürünün montajını yapmadan önce, tüm montaj talimatlarını dikkatlice okuyun ve kurulum sırasında talimatları mutlaka takip edin. Montaj, kalifiye bir uzman tarafından tüm yerel güvenlik düzenlemelerine uygun şekilde yapılmalıdır. Ürünü, montaj ve kullanımin güvenli olacağı bir yere monte edin. Ürün sadece HACH/HACH LANGE ölçüm sensörlerini/ ürünlerini, tutmak/takmak için tasarlanmıştır. Başka amaçlarla kullanılması, kullanıcı için tehlikeler doğurabilir. Bakım ve onarım sadece yetkili müşteri hizmetleri departmanı tarafından gerçekleştirilmelidir. Sadece üretici tarafından önerilen orijinal yedek parça ve aksesuarlar kullanılmalıdır. Ürüne yapılan her türlü değişiklik, tüm sorumluluğu ortadan kaldırır. Bu talimatlara uyulmaması veya ürünün üretim amacından başka bir amaçla kullanılması sonucunda kullanıcı ciddi şekilde yaralanabilir ve/veya ürün zarar görebilir. Gerekli kaynak işi yalnızca kalifiye kaynakçılar tarafından DIN / EN 287'ye göre yapılmalıdır, veya müteahhitler tarafından EN 3834-2'ye göre yapılmalıdır.

ZH 在安装/固定产品之前，请仔细阅读所有安装说明，并在安装过程中遵守这些说明。必须由合格的专家完成安装，并遵守当地的所有安全法规。仔细选择安装地点，确保安全地安装和操作。本产品只能用于固定/连接 HACH/HACH LANGE 测量传感器/产品。用于其他用途可能会给用户带来危险。维护和修理工作应由经授权的客户服务部门完成。只能使用正宗替换件和制造商推荐的附件。对本产品进行任何更改均可能导致所有担保失效。不遵守这些说明，或者将本产品用于其它用途，可能会对用户造成严重伤害和/或设备损坏。所需的焊接工作必须根据 DIN/EN 287，由合格的焊接工人单独执行，或者根据 EN 3834-2 由承包人执行。



 LZX936	SOLITAX inline sc		A1		A2	M16x45mm A4 ISO4017	A3	LZY462	A4	DOC273. 99. 03911	A5	LZV678	
	SOLITAX highline sc		1x		4x		1x		1x		1x		
			A6a		A6b	M8x20mm A4 LZY962							
			1x		1x								

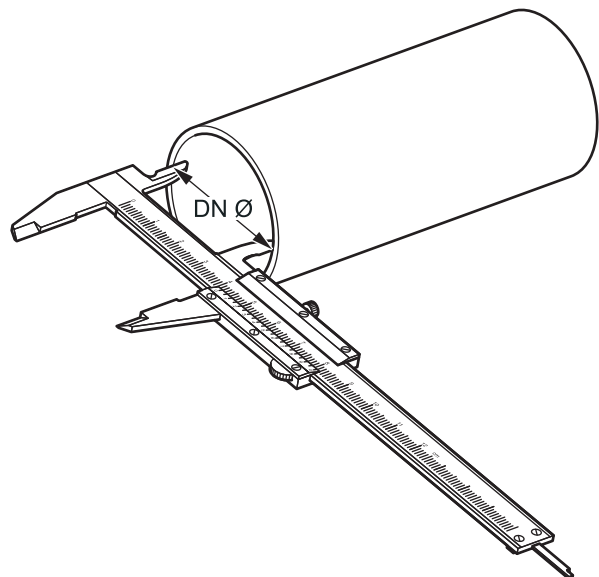
 LZX660	SS 316Ti/ 1.4571 DN65/PN16 EN 1092		B1	DN65	B2	DOC273. 99. 03911	B3	DN65					
			1x		1x		1x						

 LZX661	C-steel / 1.0037 DN65/PN16 EN 1092		B1	DN65	B2	DOC273. 99. 03911	B3	DN65					
			1x		1x		1x						

1



LZX660 / LZX661



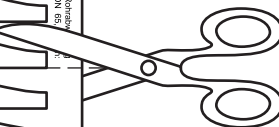
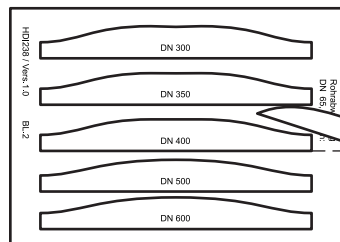
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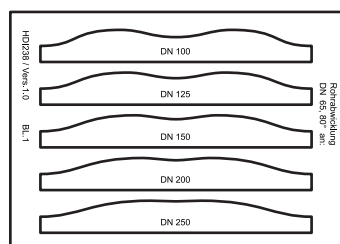
A4



DN Ø =



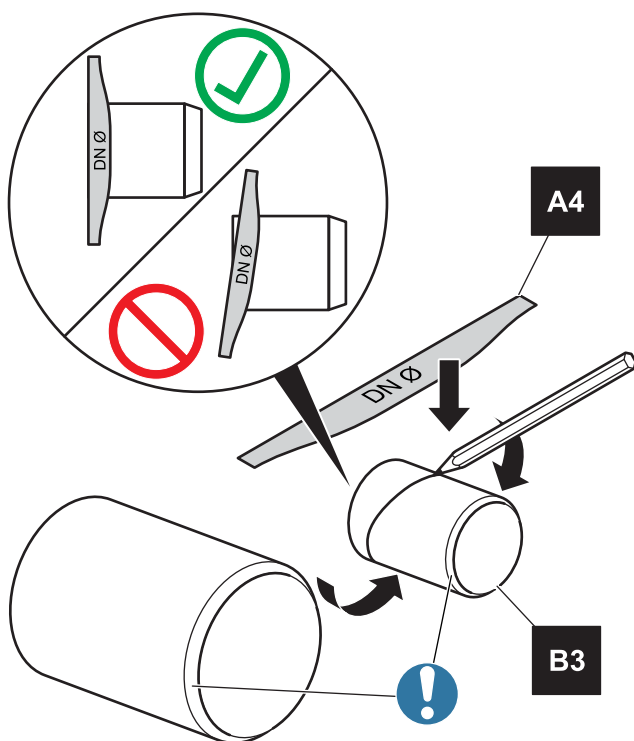
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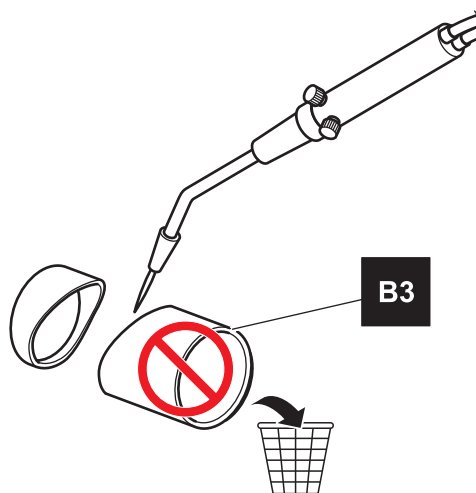
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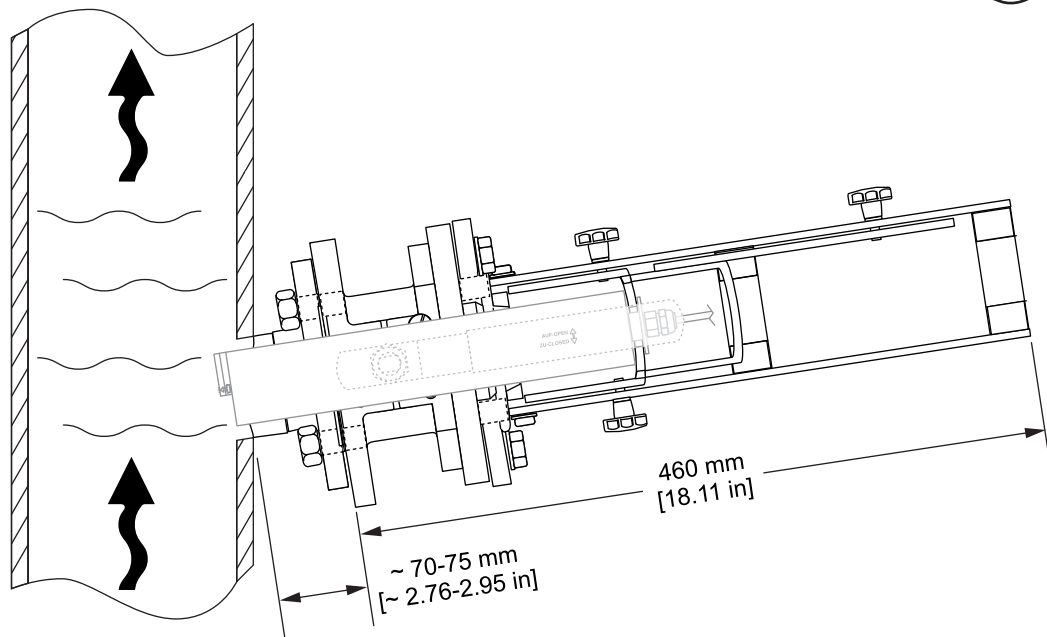
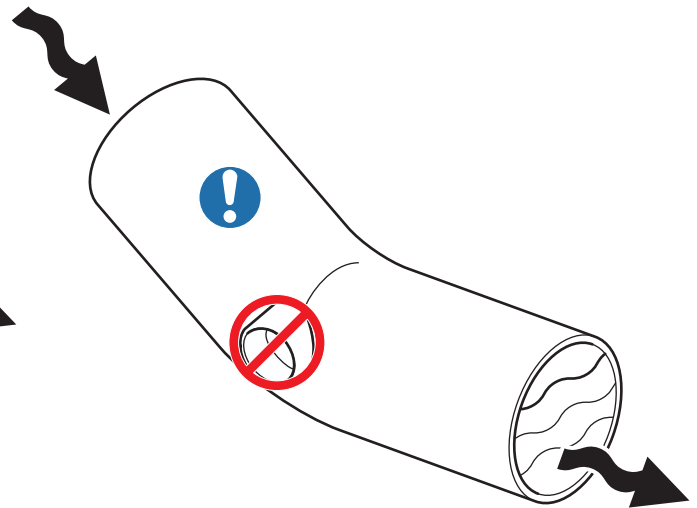
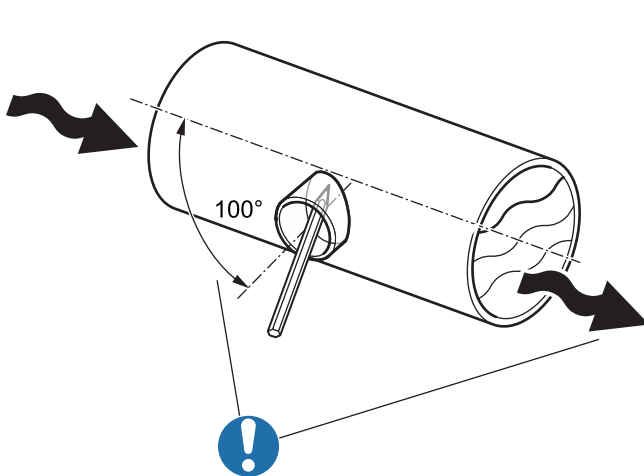
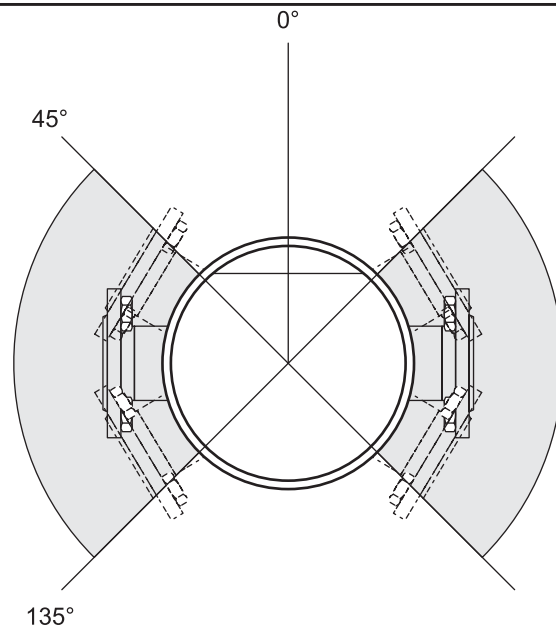


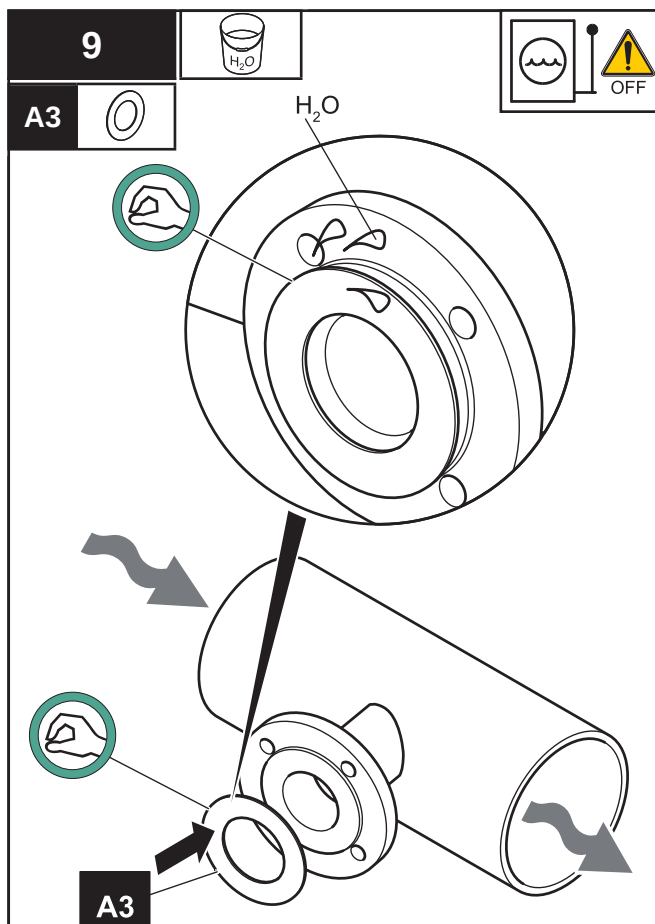
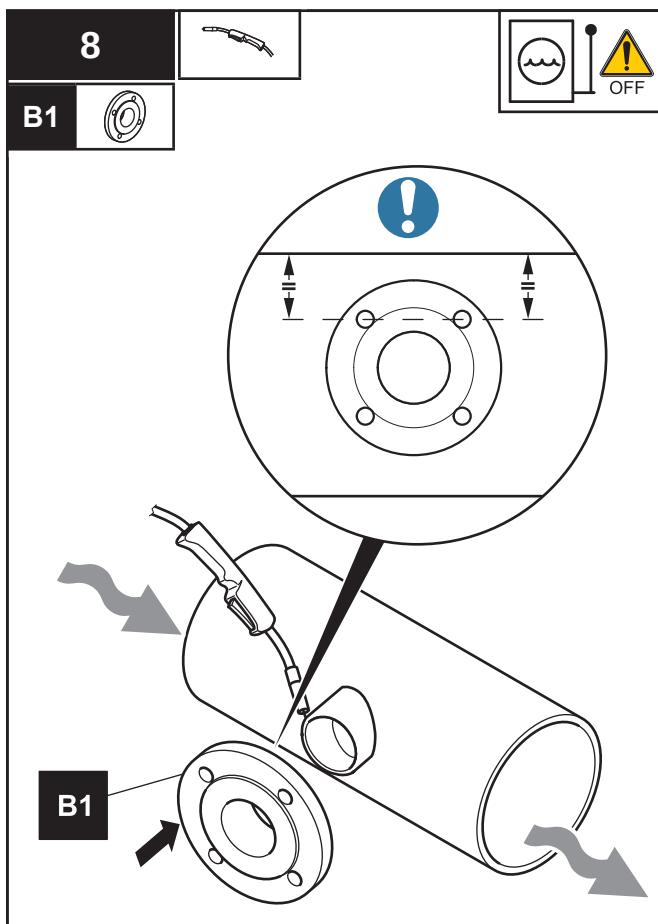
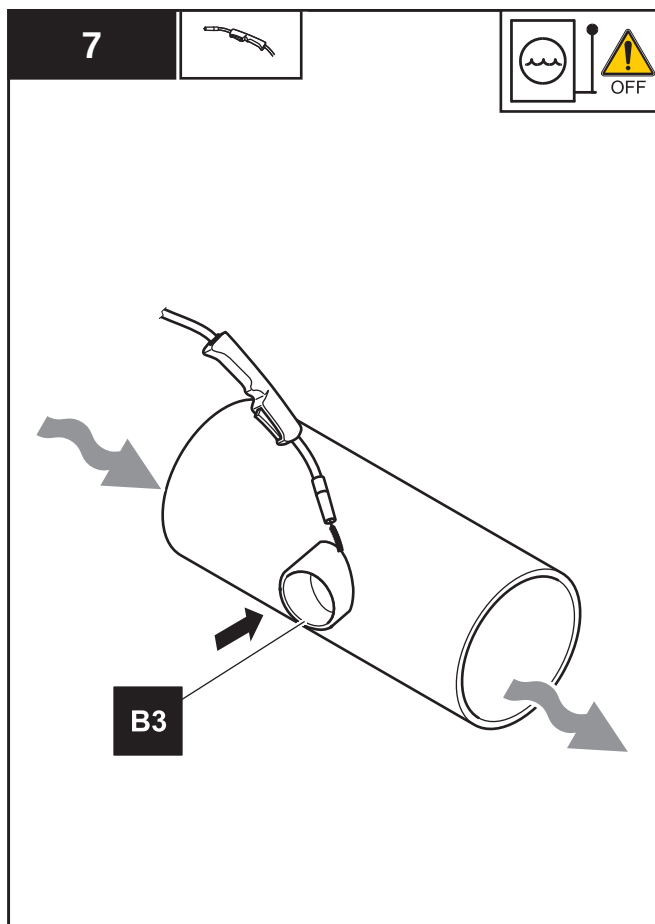
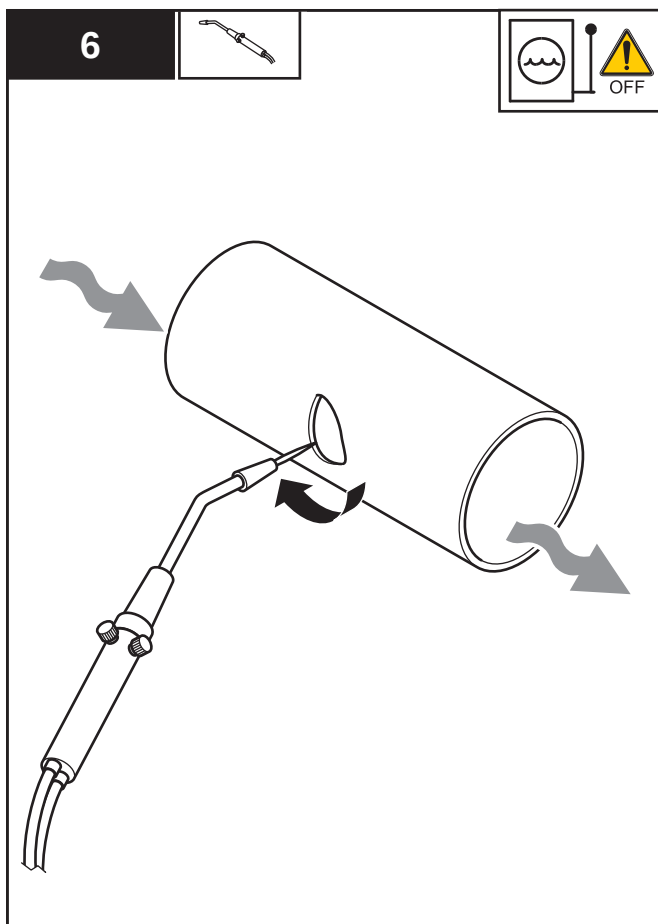
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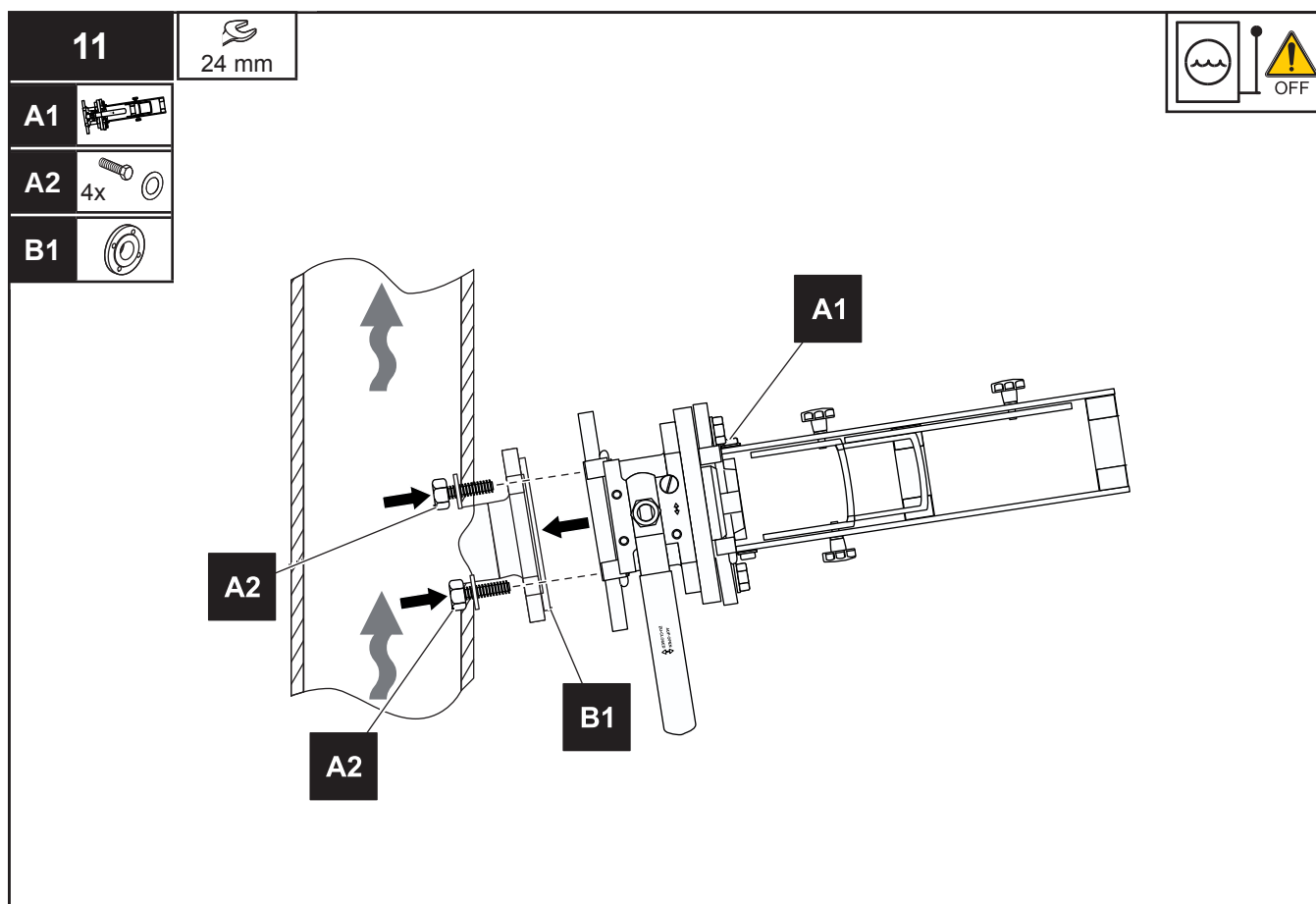
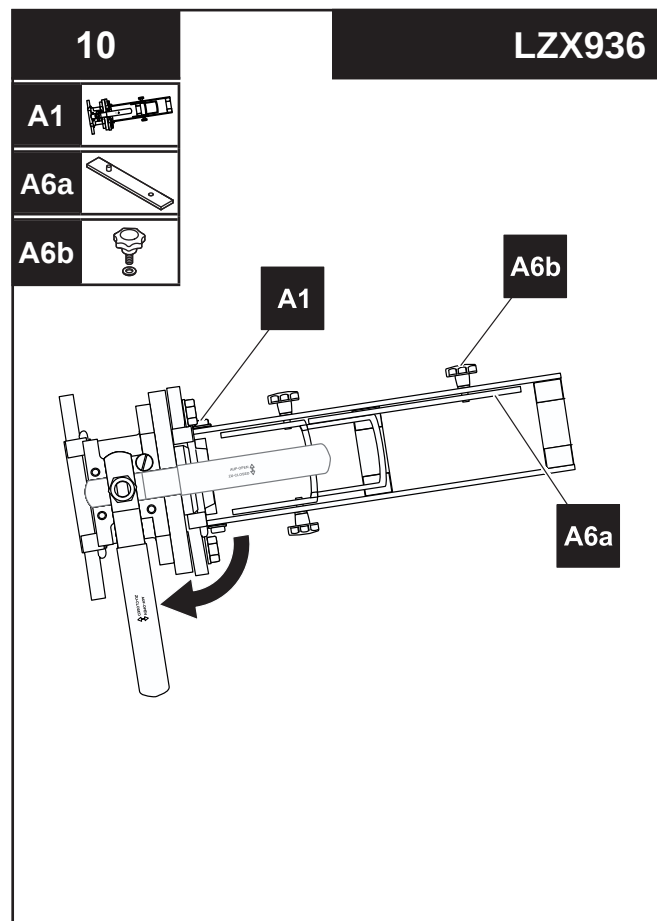


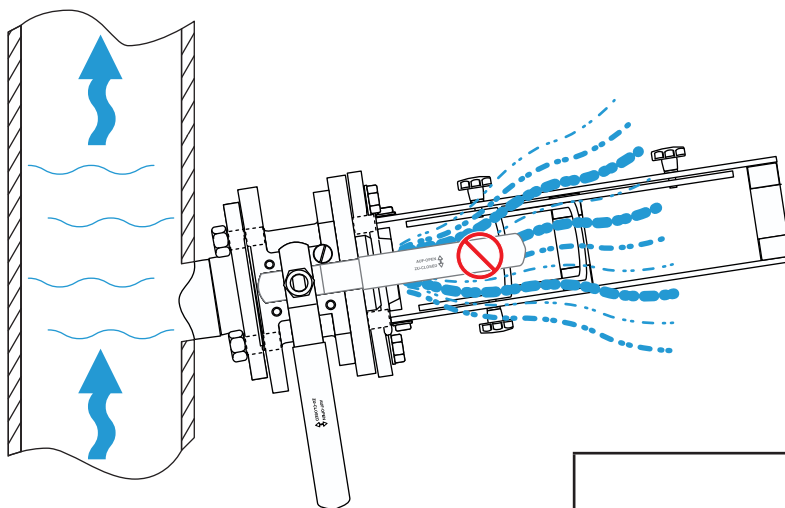
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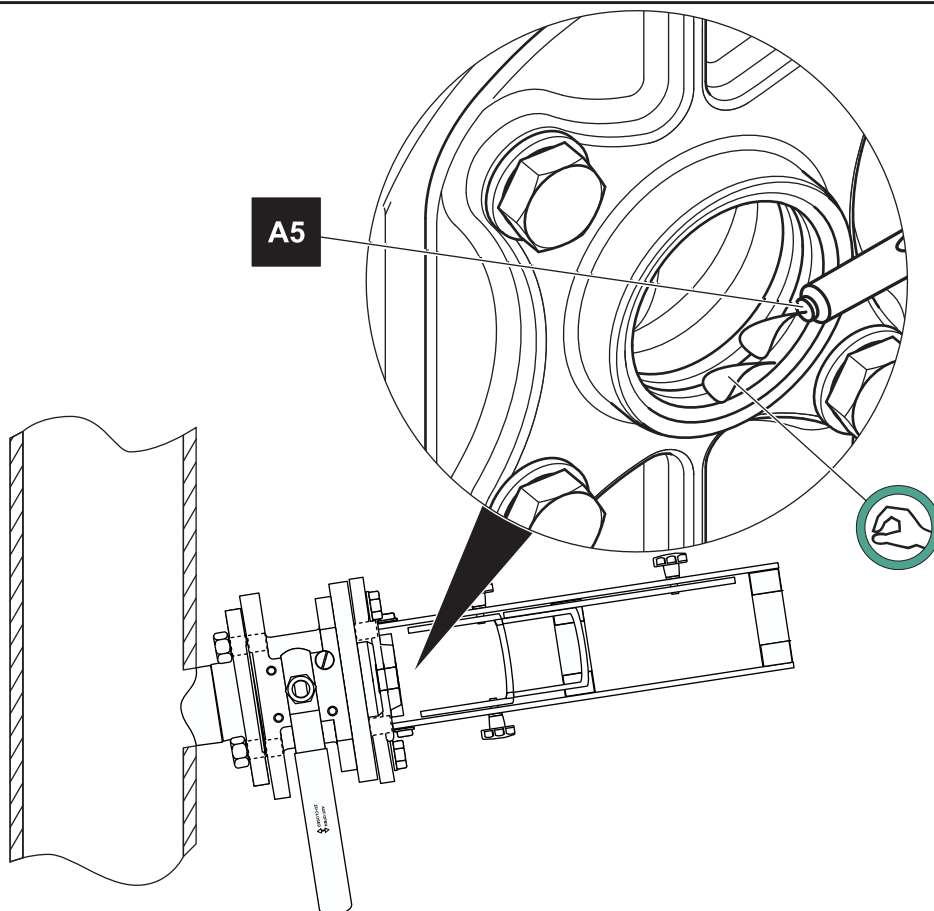
$p_{\max}$ in process =
 $\leq 1 \cdot 10^5$ Pa (1 bar, 14 psi)

12

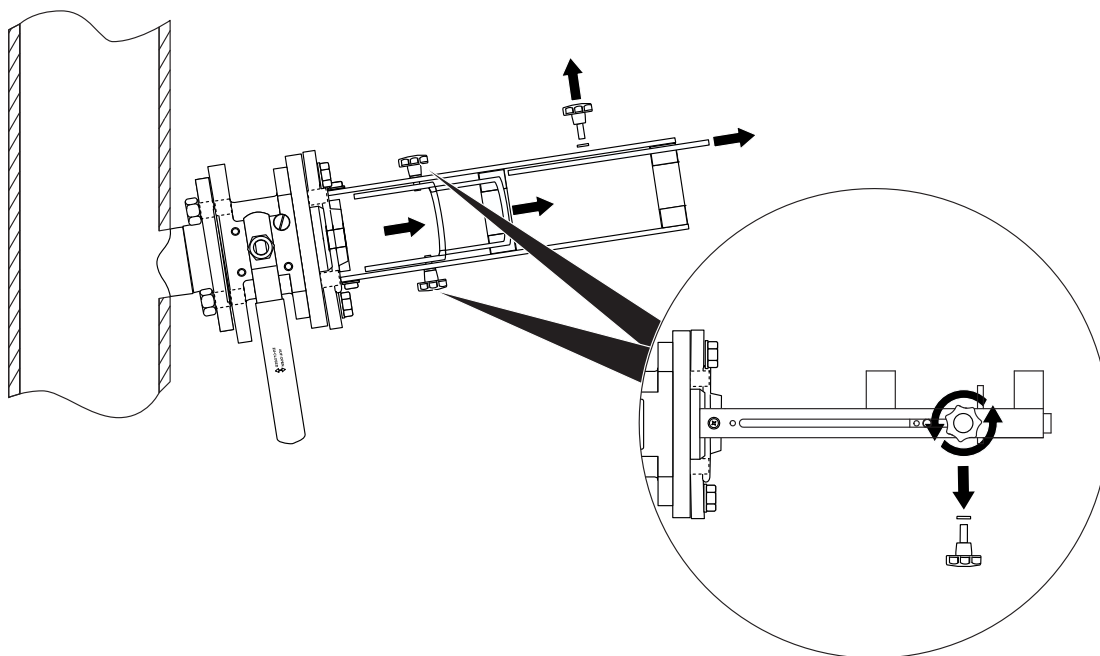
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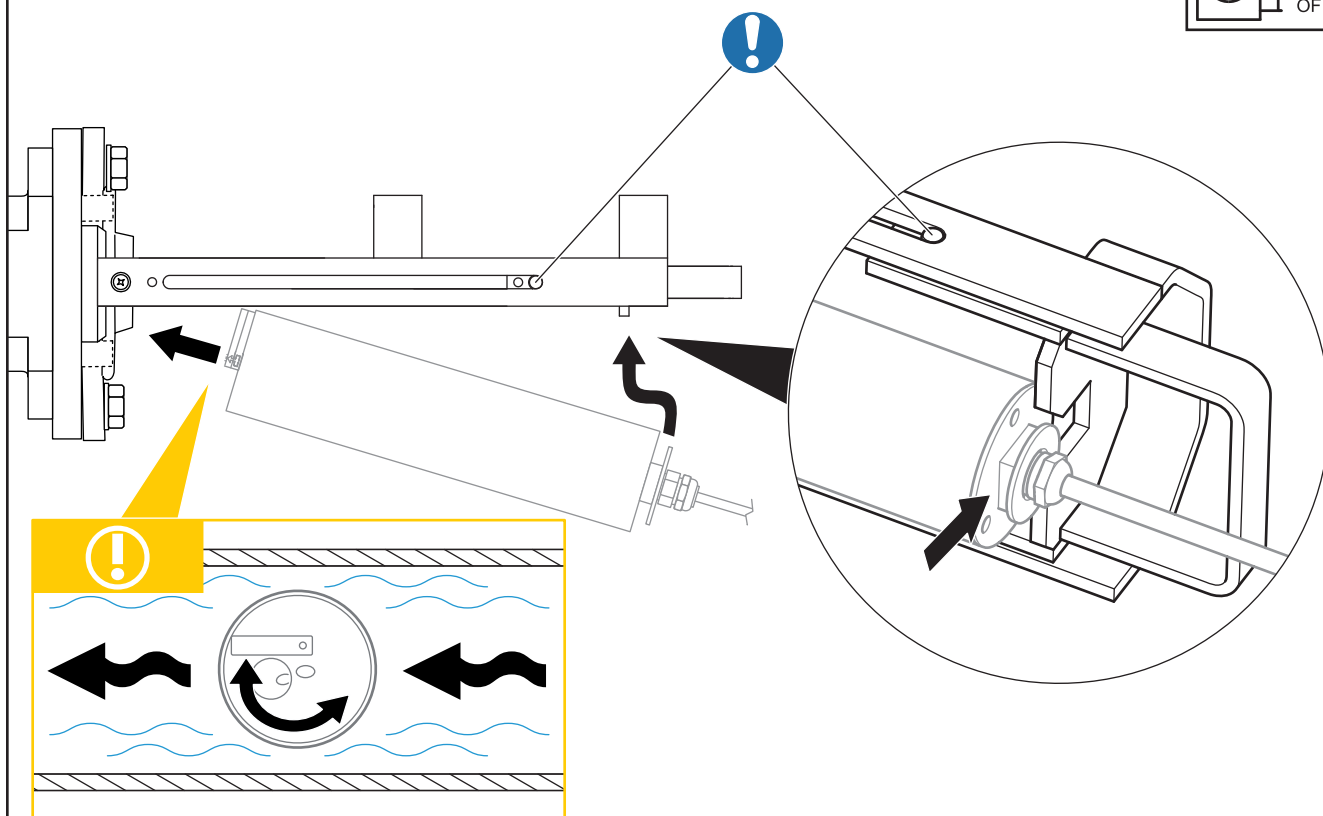
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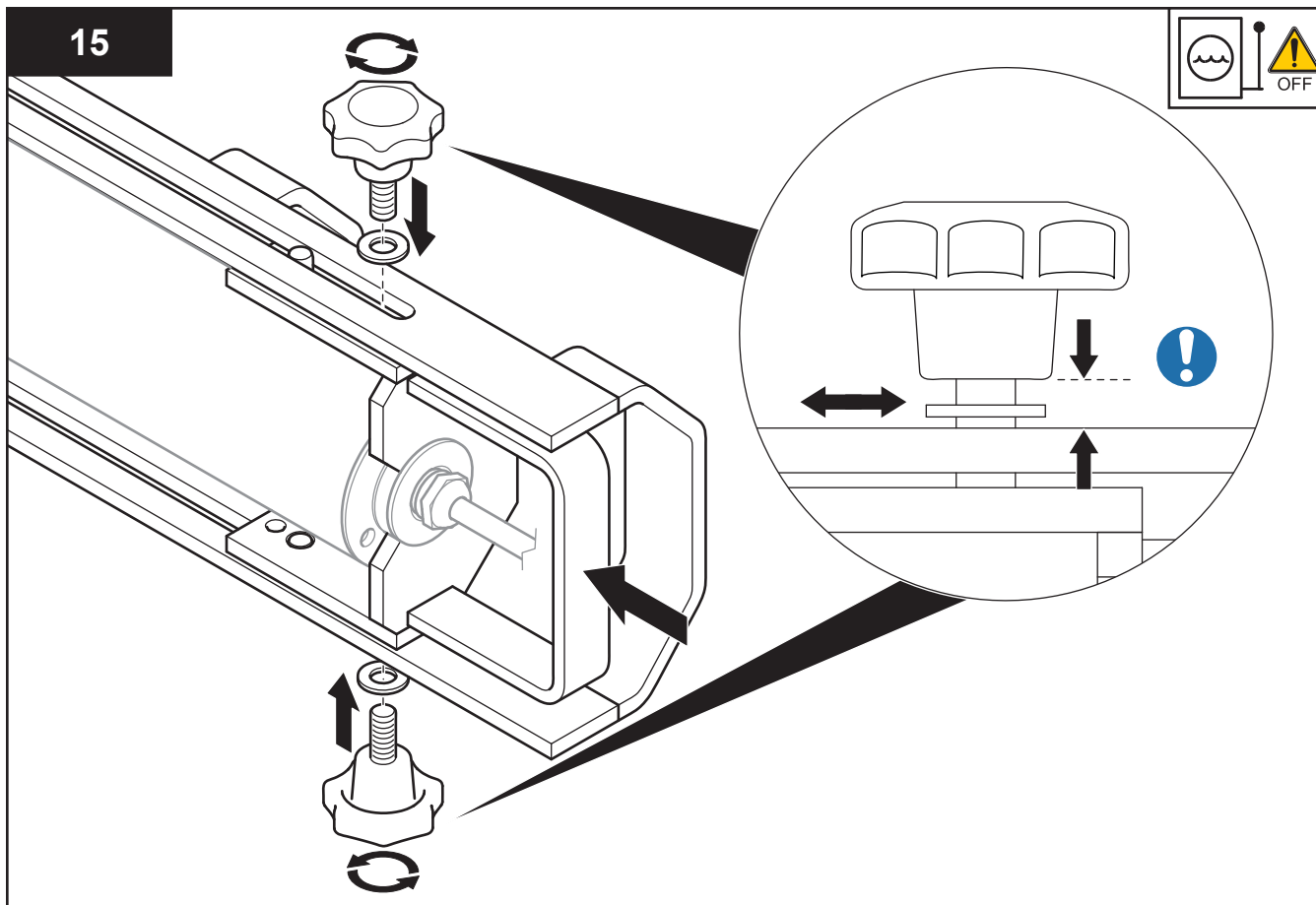
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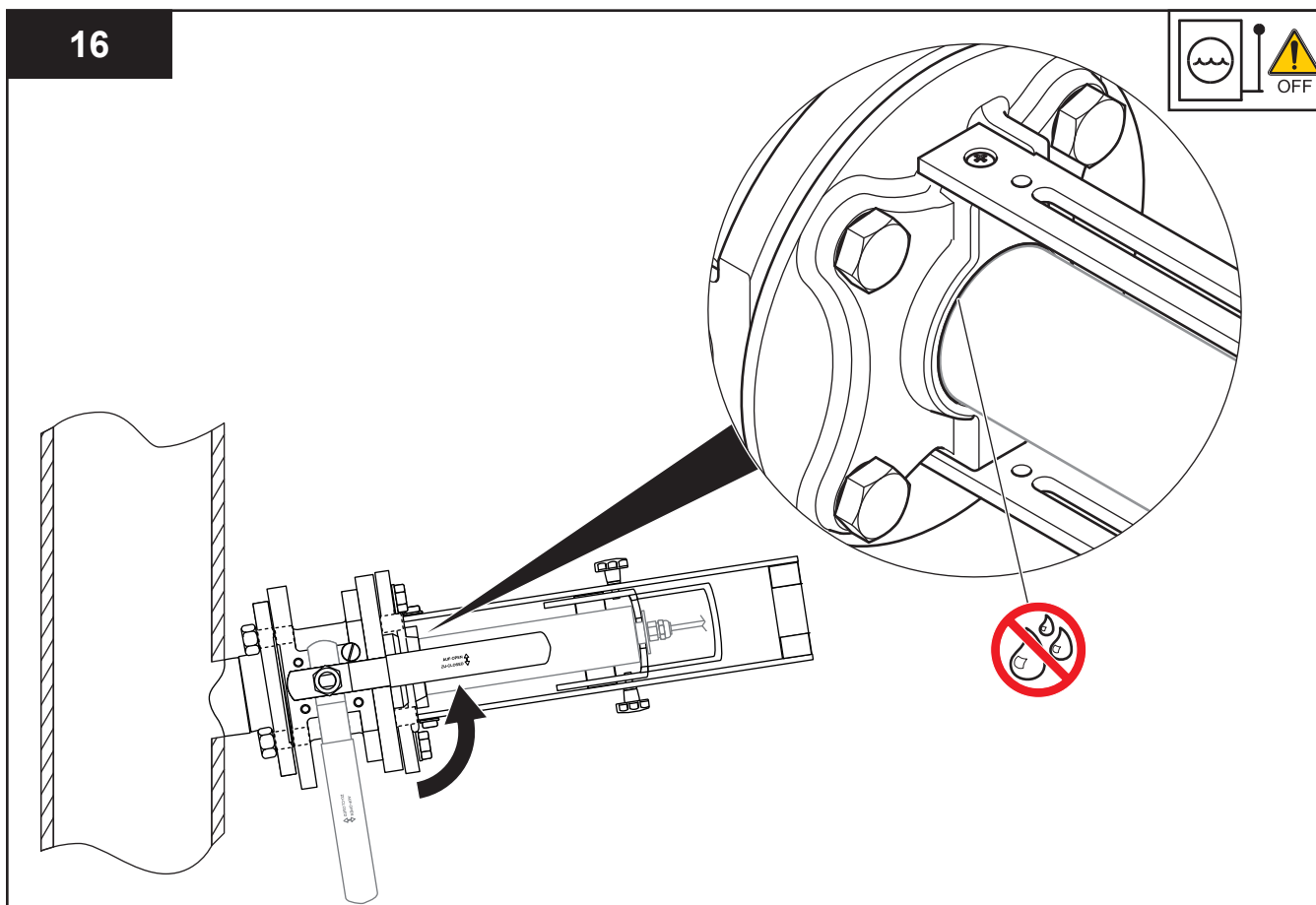
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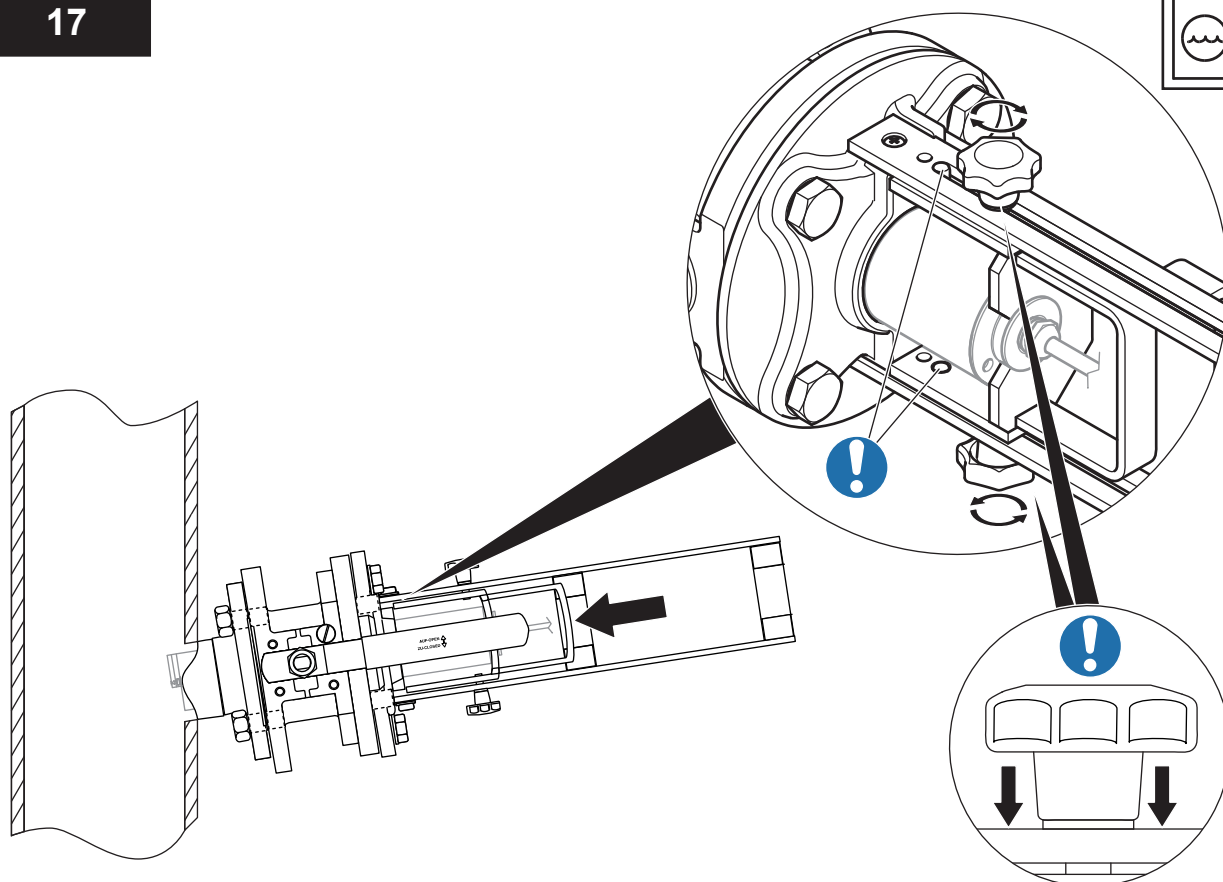
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16



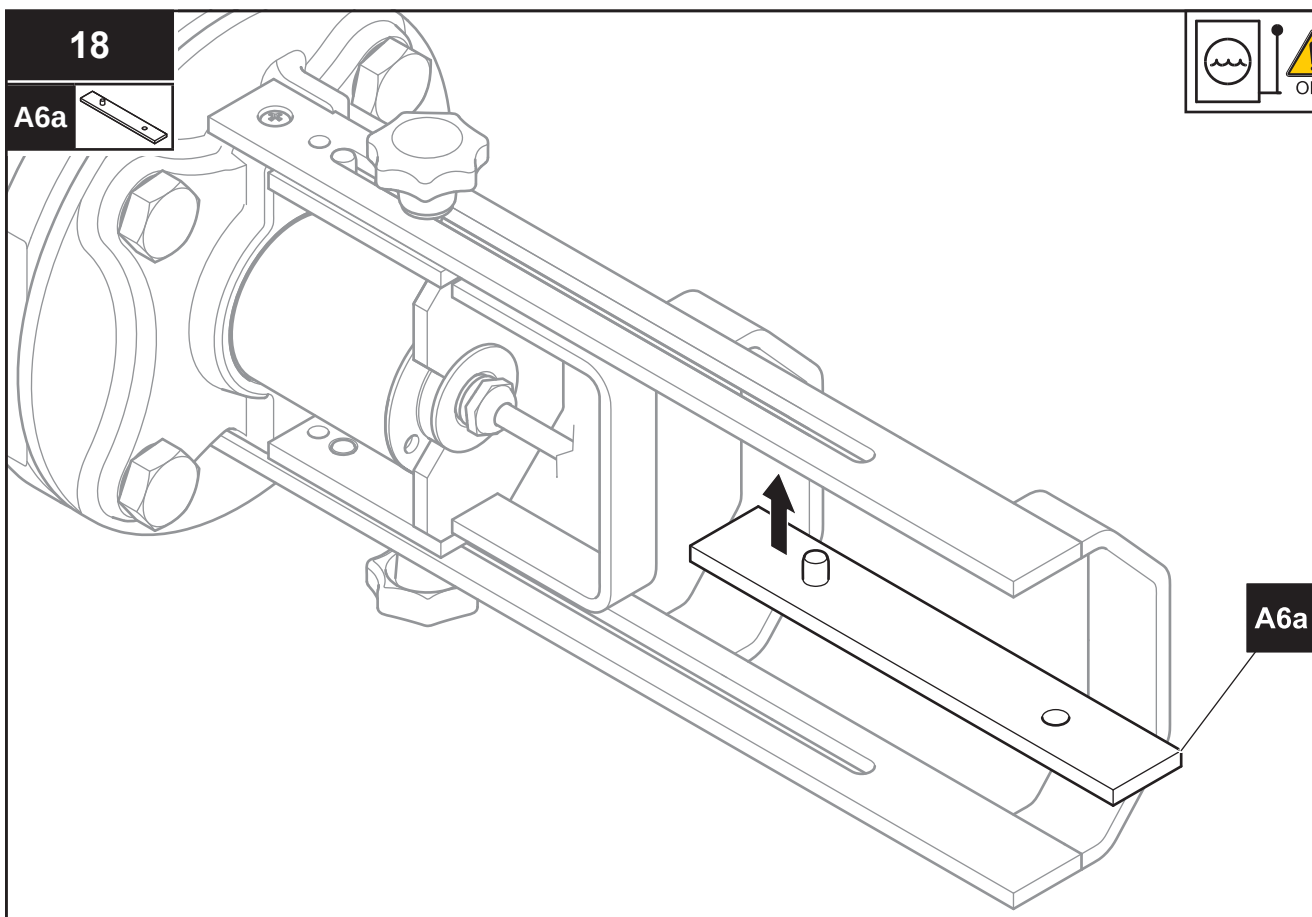
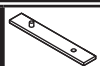
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18



A6a



A6a

19



A6a

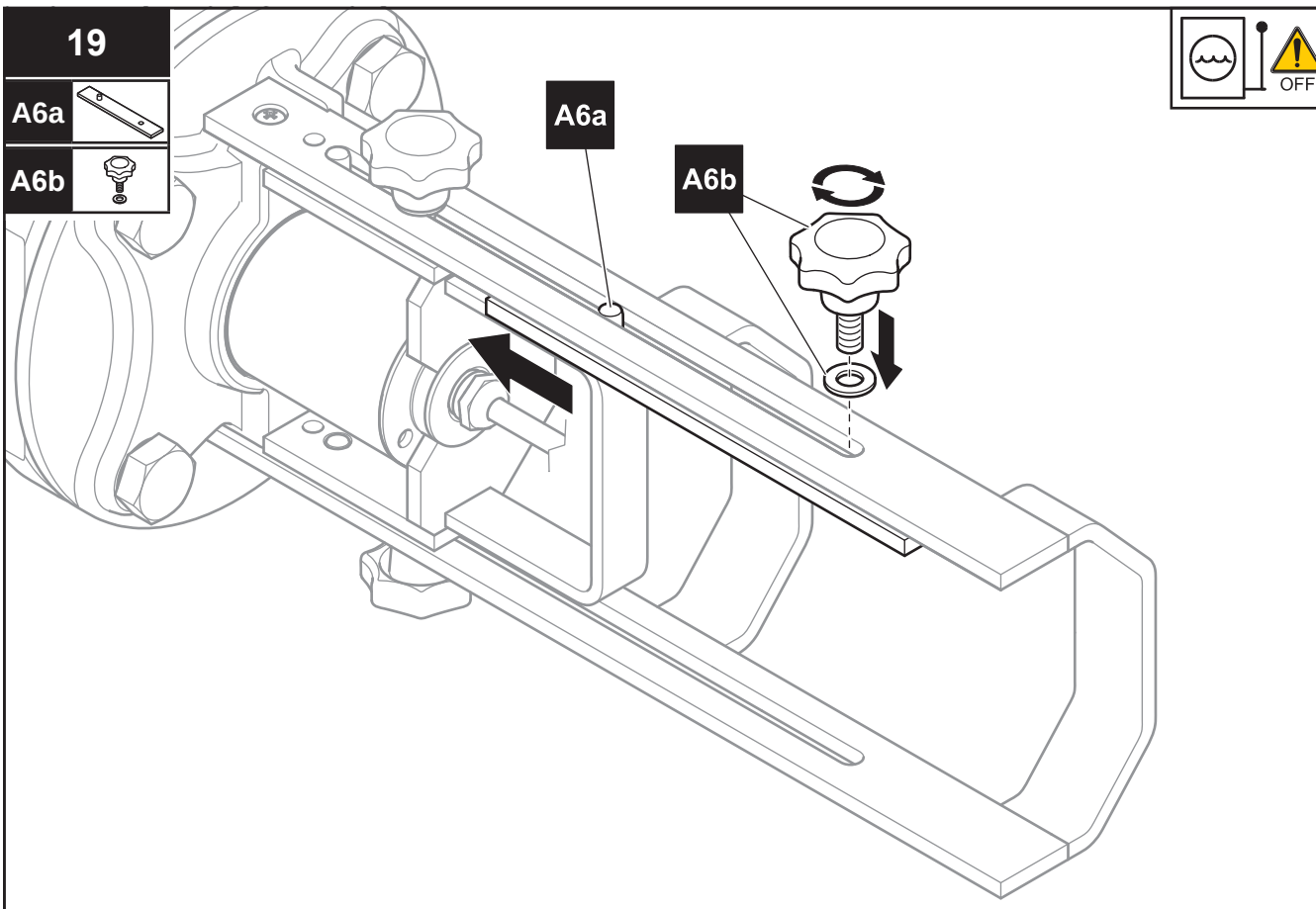
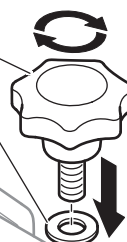


A6b

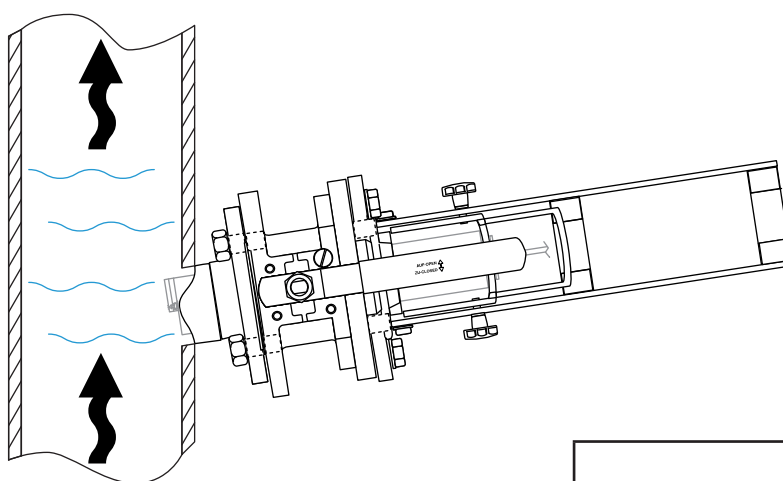


A6a

A6b



20



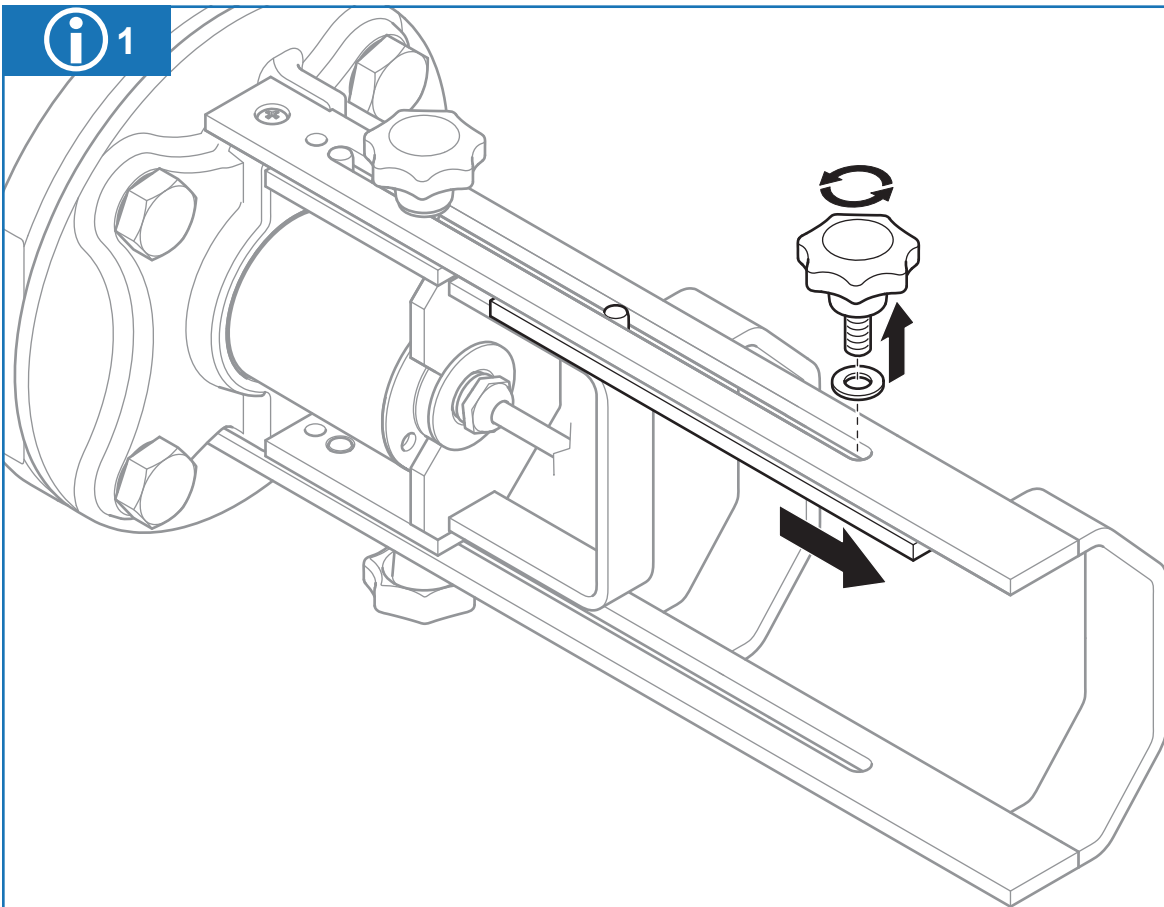
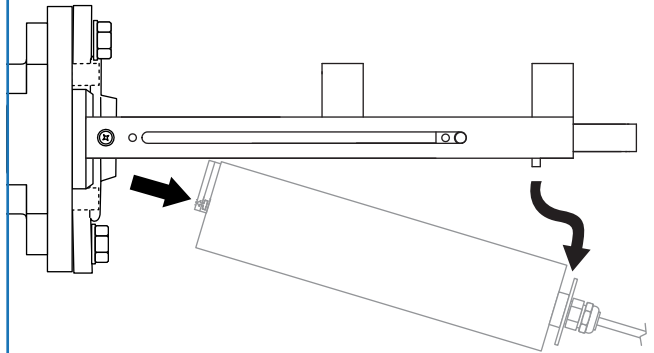
$p_{\max}$ in process =
 $\leq 1 \cdot 10^5 \text{ Pa (1 bar, 14 psi)}$



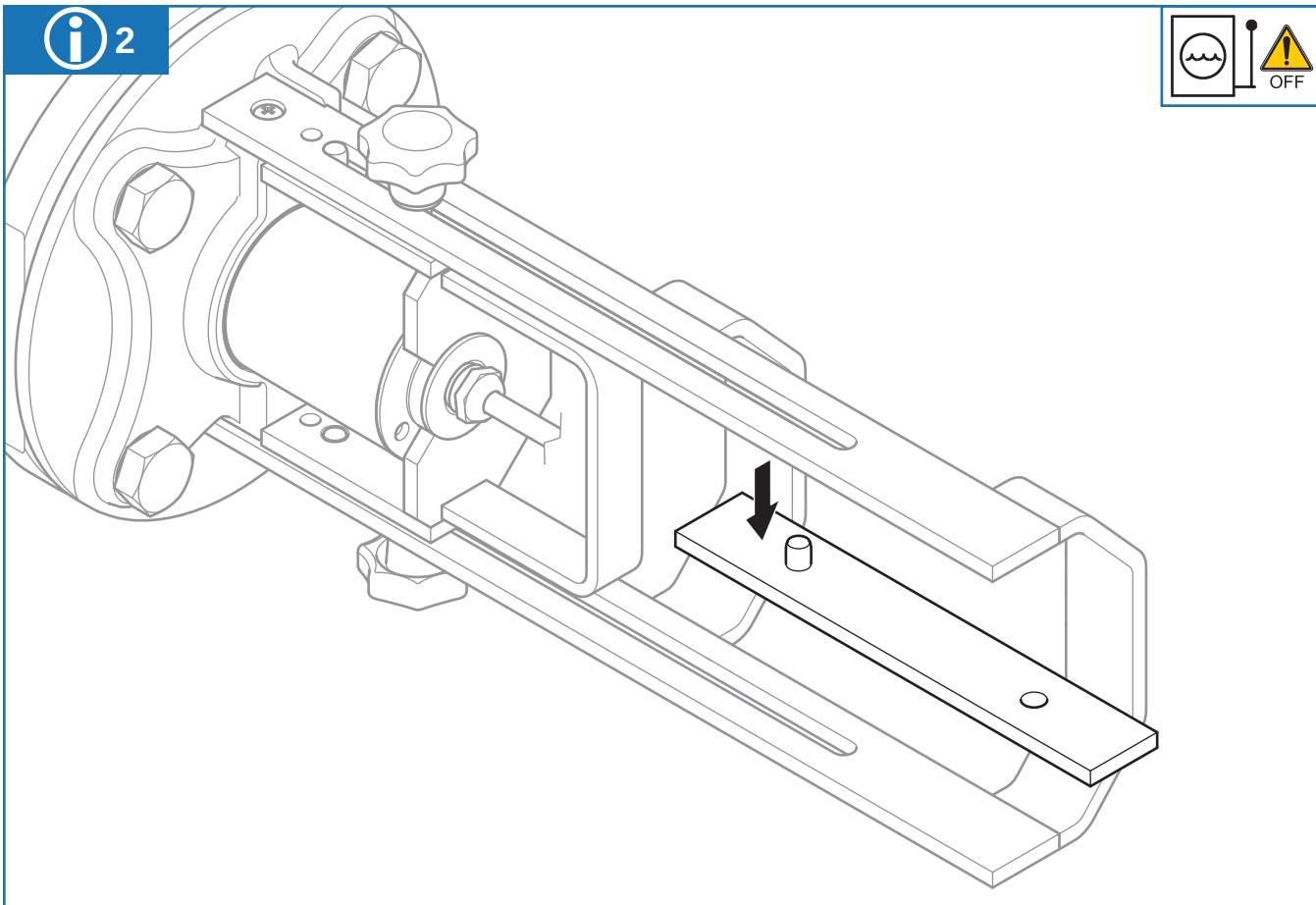
$p_{\max}$ in service =
 $0 \cdot 10^5$ Pa (0 bar, 0 psi) pressure free



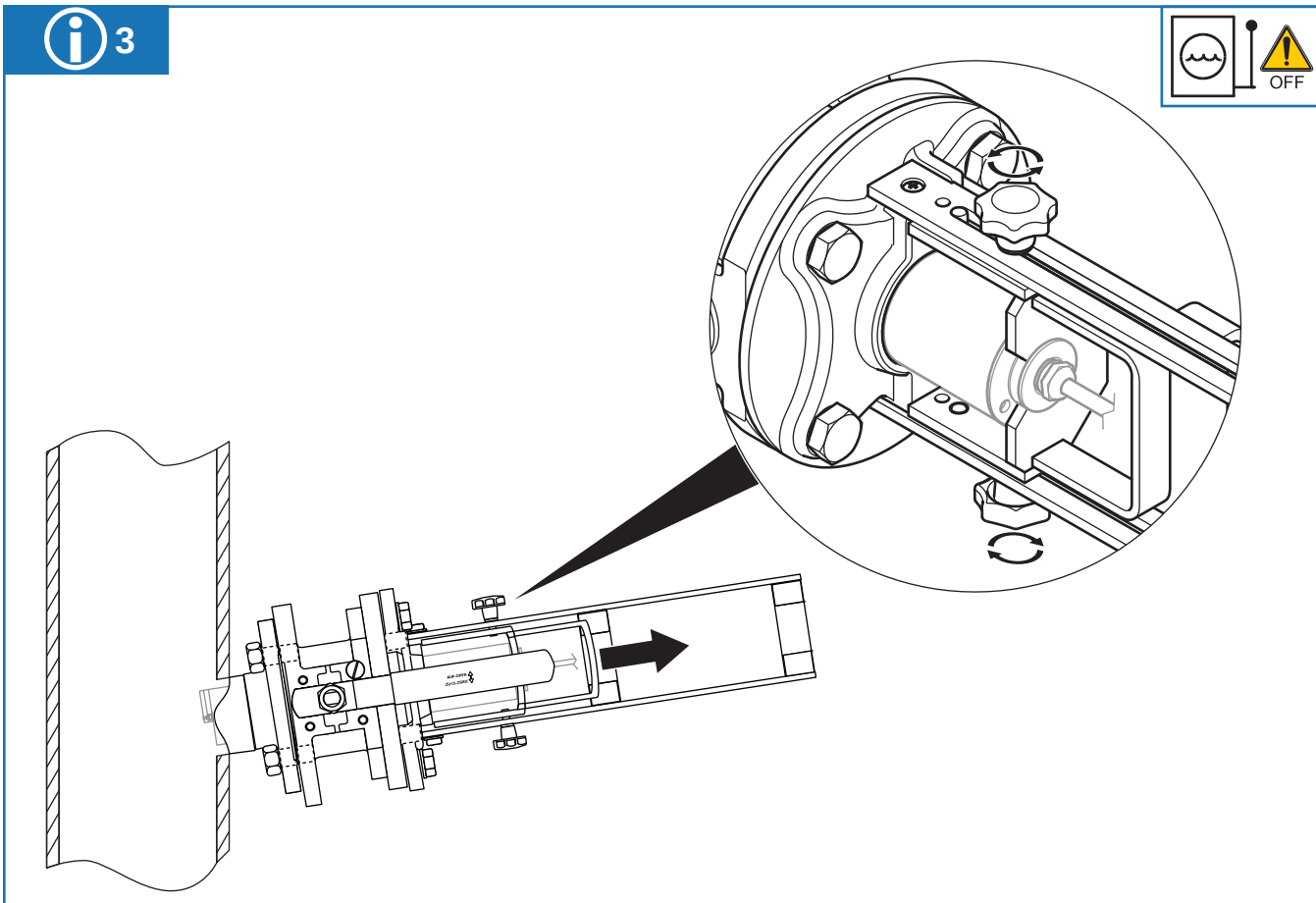
In Service



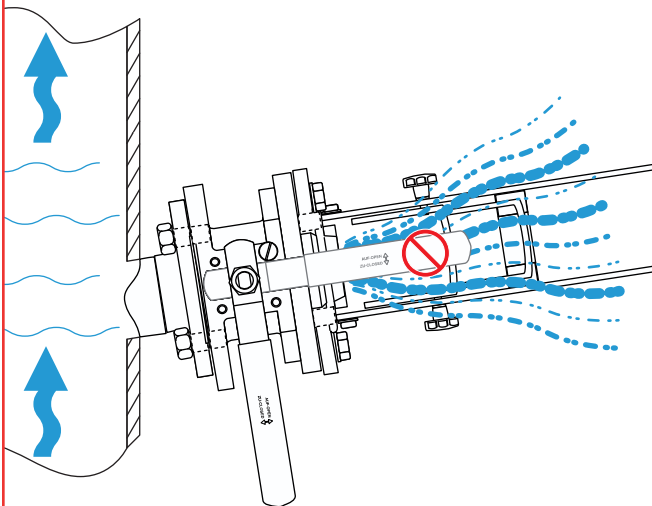
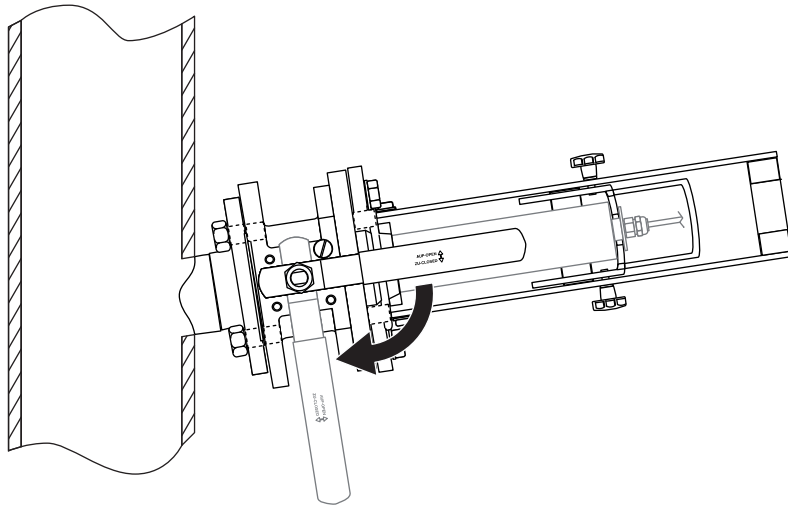
i 2



i 3

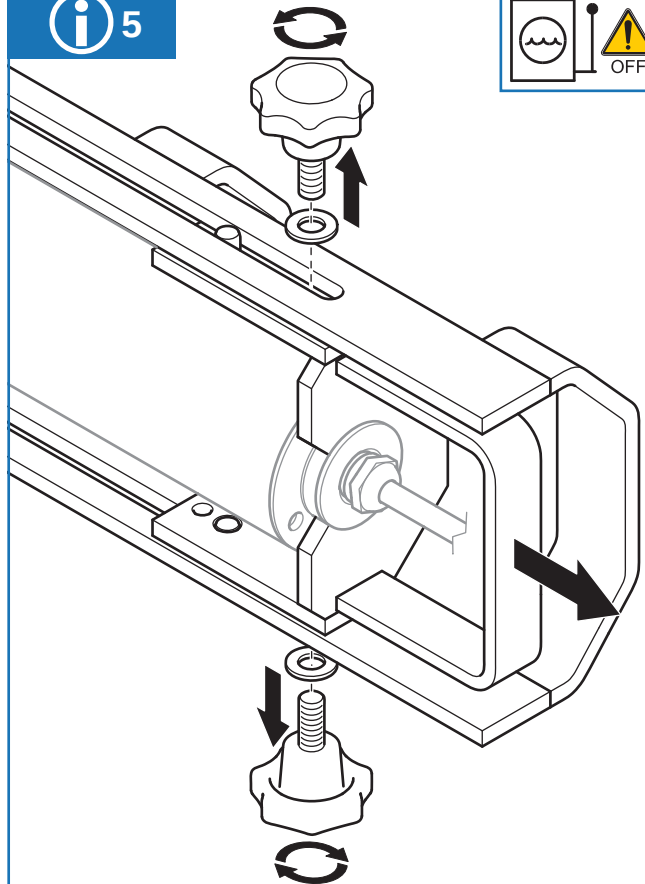


i 4

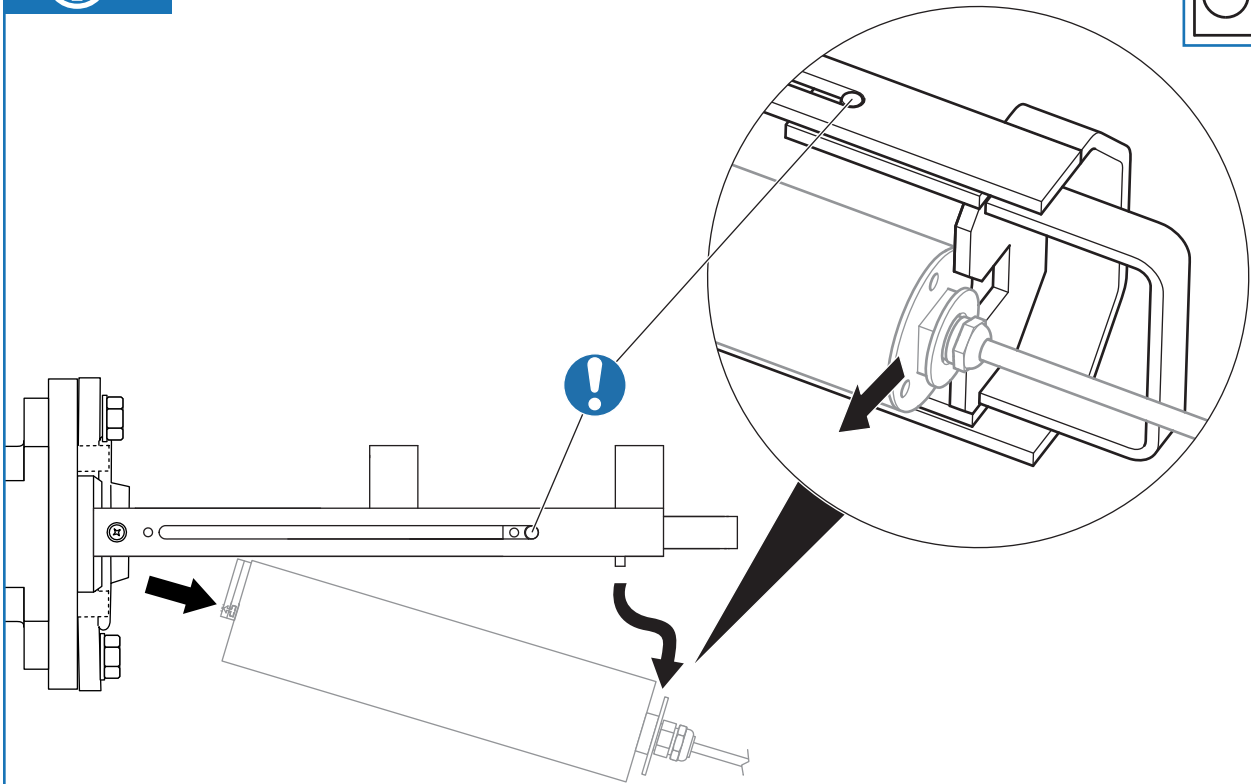


p_{max} in process =
 $\leq 1 \cdot 10^5 \text{ Pa (1 bar, 14 psi)}$

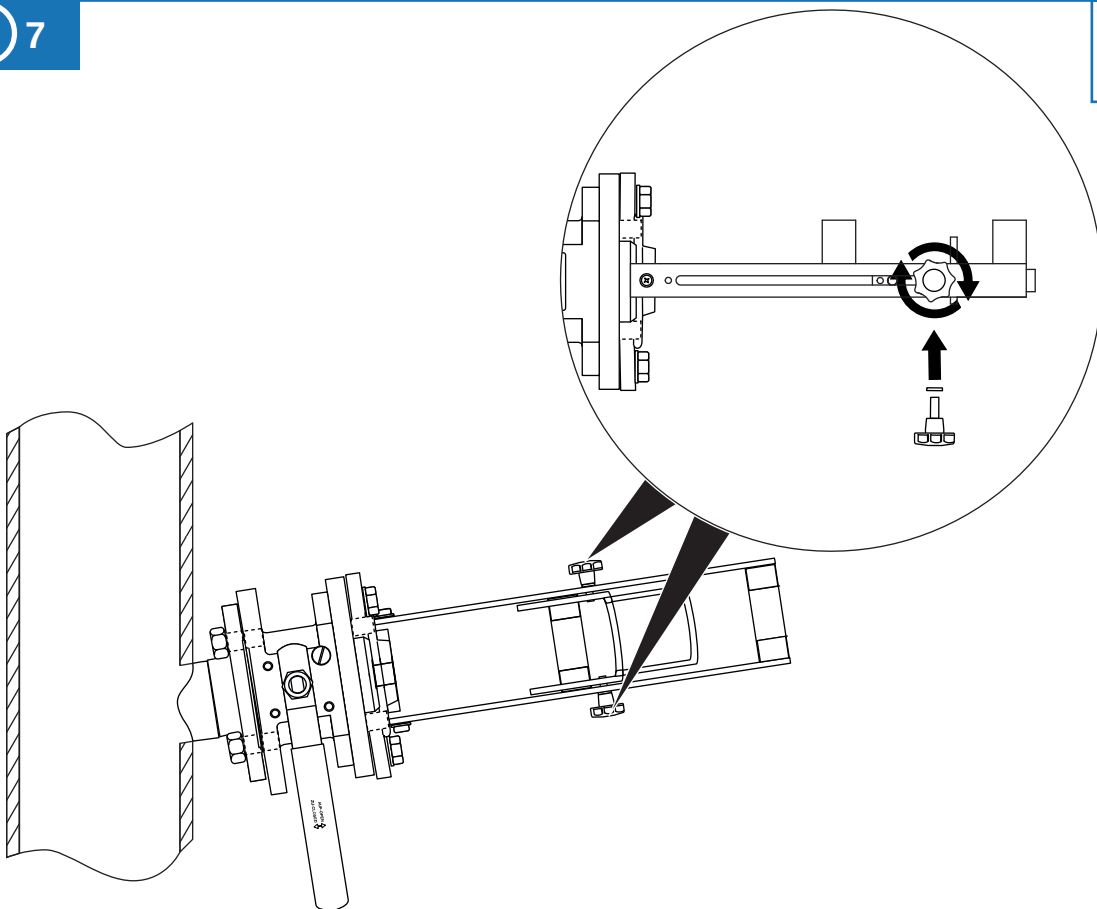
i 5



i 6



i 7



[illegible]

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info.russia@hach-lange.com
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CS-404-500 : Identification sheet



VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
E&H	ST-404-564	FIT4-011	3"	FLOWMETER	Electromagnetic flowmeter// Manuf: E&H // Model : 50W80-ULGA1RC2BAAW+1// DN80 (3")// Liner: Polyurethane Process Connection: Cl.150, A105, flange ANSI B16.5 Electrodes: 1.4435/316L, bullet nose Calibration: 0.5% Additional Test, certificate: w/o	Approval: FM NI Cl. I Div. 2 / CSA Cl. I Div. 2 Housing: Wall Alu, IP67 NEMA4X Cable, Remote Version: 10m/30ft coil + signal cable Cable Entry: Thread NPT 1/2 Power Supply; Display:	WEA= language DE+EN+FR+IT+ES+P T+NL Adjustment; Software Feature: A Factory setup; basic version Output, Input: W 4-20mA SIL HART	SLUDGE TANK		rev1

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Level



Pressure



Flow



Temperature

Liquid
Analysis

Registration

Systems
Components

Services



Solutions

Technical Information

Proline Promag 50W, 53W

Electromagnetic Flow Measuring System

Flow measurement of liquids in water or wastewater applications



Application

Electromagnetic flowmeter for bidirectional measurement of liquids with a minimum conductivity of $\geq 5 \mu\text{S}/\text{cm}$:

- Drinking water
- Wastewater
- Sewage sludge
- Flow measurement up to 110000 m³/h (484315 gal/min)
- Fluid temperature up to +80 °C (+176 °F)
- Process pressures up to 40 bar (580 psi)
- Lengths in accordance with DVGW/ISO

Application-specific lining of the measuring pipe from polyurethane or hard rubber with the following drinking water permissions:

- KTW
- WRAS
- NSF
- ACS

Approvals for hazardous area:

- ATEX
- IECEx
- FM

- CSA
- NEPSI

Connection to process control system:

- HART
- PROFIBUS DP/PA
- FOUNDATION Fieldbus
- MODBUS RS485

Your benefits

Promag measuring devices offer you cost-effective flow measurement with a high degree of accuracy for a wide range of process conditions.

The uniform Proline transmitter concept comprises:

- Modular device and operating concept resulting in a higher degree of efficiency
- Software options for batching, electrode cleaning and for measuring pulsating flow
- High degree of reliability and measuring stability
- Uniform operating concept

The tried-and-tested Promag sensors offer:

- No pressure loss
- Not sensitive to vibrations
- Simple installation and commissioning

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Function and system design

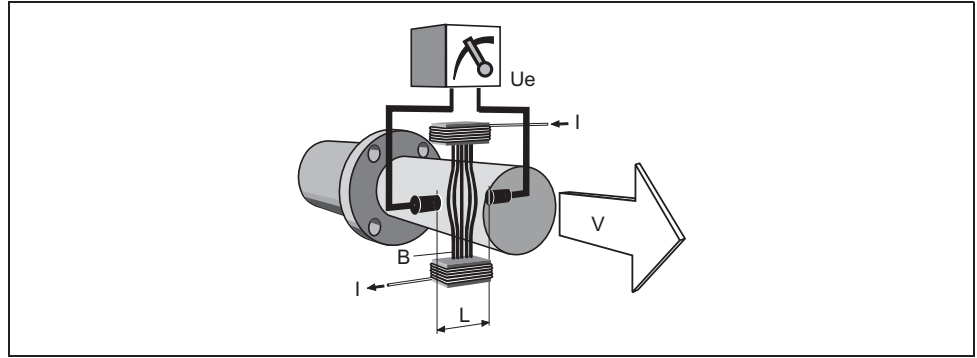
Measuring principle

Following Faraday's law of magnetic induction, a voltage is induced in a conductor moving through a magnetic field.

In the electromagnetic measuring principle, the flowing medium is the moving conductor.

The voltage induced is proportional to the flow velocity and is supplied to the amplifier by means of two measuring electrodes. The flow volume is calculated by means of the pipe cross-sectional area.

The DC magnetic field is created through a switched direct current of alternating polarity.



$$U_e = B \cdot L \cdot v$$

$$Q = A \cdot v$$

U_e	Induced voltage
B	Magnetic induction (magnetic field)
L	Electrode spacing
v	Flow velocity
Q	Volume flow
A	Pipe cross-section
I	Current strength

Measuring system

The measuring system consists of a transmitter and a sensor.

Two versions are available:

- Compact version: Transmitter and sensor form a mechanical unit.
- Remote version: Sensor is mounted separate from the transmitter.

Transmitter:

- Promag 50 (user interface with push buttons for operation, two-line display, illuminated)
- Promag 53 ("Touch Control" without opening the housing, four-line display, unilluminated)

Sensor:

- Promag W (DN 25 to 2000 / 1 to 78")

Input

Measured variable	Flow velocity (proportional to induced voltage)
Measuring ranges	Measuring ranges for liquids Typically $v = 0.01$ to 10 m/s (0.03 to 33 ft/s) with the specified accuracy
Operable flow range	Over $1000 : 1$
Input signal	Status input (auxiliary input) ■ $U = 3$ to 30 V DC, $R_i = 5$ kΩ, galvanically isolated ■ Configurable for: totalizer(s) reset, measured value suppression, error-message reset Status input (auxiliary input) with PROFIBUS DP and MODBUS RS485 ■ $U = 3$ to 30 V DC, $R_i = 3$ kΩ, galvanically isolated ■ Switching level: 3 to 30 V DC, independent of polarity ■ Configurable for: totalizer(s) reset, measured value suppression, error-message reset, batching start/stop (optional), batch totalizer reset (optional) Current input (only Promag 53) ■ active/passive selectable, galvanically isolated, full scale value selectable, resolution: 3 μA, temperature coefficient: typ. 0.005% o.r./$^{\circ}$C (o.r. = of reading) ■ active: 4 to 20 mA, $R_i \leq 150$ Ω, max. 24 V DC, short-circuit-proof ■ passive: $0/4$ to 20 mA, $R_i < 150$ Ω, max. 30 V DC

Output

Output signal	Promag 50 Current output active/passive selectable, galvanically isolated, time constant selectable (0.01 to 100 s), full scale value selectable, temperature coefficient: typ. 0.005% o.r./$^{\circ}$C (o.r. = of reading), resolution: 0.5 μA ■ active: $0/4$ to 20 mA, $R_L < 700$ Ω (HART: $R_L \geq 250$ Ω) ■ passive: 4 to 20 mA, operating voltage V_S: 18 to 30 V DC, $R_i \geq 150$ Ω Pulse/frequency output passive, open collector, 30 V DC, 250 mA, galvanically isolated ■ Frequency output: full scale frequency 2 to 1000 Hz ($f_{\max} = 1250$ Hz), on/off ratio $1:1$, pulse width max. 10 s ■ Pulse output: pulse value and pulse polarity selectable, max. pulse width configurable (0.5 to 2000 ms) PROFIBUS DP interface ■ Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated ■ Profi version 3.0 ■ Data transmission rate: $9,6$ kBaud to 12 MBaud ■ Automatic data transmission rate recognition ■ Function blocks: $1 \times$ analog Input, $1 \times$ totalizer ■ Output data: volume flow, totalizer ■ Input data: positive zero return (ON/OFF), totalizer control, value for local display ■ Cyclic data transmission compatible with previous model Promag 33 ■ Bus address adjustable via miniature switches or local display (optional) at the measuring device PROFIBUS PA interface ■ Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated ■ Profi version 3.0 ■ Current consumption: 11 mA ■ Permissible supply voltage: 9 to 32 V ■ Bus connection with integrated reverse polarity protection ■ Error current FDE (Fault Disconnection Electronic): 0 mA ■ Function blocks: $1 \times$ analog input, $2 \times$ totalizer ■ Output data: volume flow, totalizer ■ Input data: positive zero return (ON/OFF), control totalizer, value for local display ■ Cyclic data transmission compatible with previous model Promag 33 ■ Bus address adjustable via miniature switches or local display (optional) at the measuring device
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Promag 53

Current output

active/passive selectable, galvanically isolated, time constant selectable (0.01 to 100 s), full scale value selectable, temperature coefficient: typ. 0.005% o.r./°C (o.r. = of reading), resolution: 0.5 μ A

- active: 0/4 to 20 mA, $R_L < 700 \Omega$ (HART: $R_L \geq 250 \Omega$)
- passive: 4 to 20 mA, operating voltage V_S : 18 to 30 V DC, $R_i \geq 150 \Omega$

Pulse/frequency output

active/passive selectable, galvanically isolated (Ex i version: only passive)

- active: 24 V DC, 25 mA (max. 250 mA during 20 ms), $R_L > 100 \Omega$
- passive: open collector, 30 V DC, 250 mA
- Frequency output: full scale frequency 2 to 10000 Hz ($f_{max} = 12500$ Hz), EEx-ia: 2 to 5000 Hz; on/off ratio 1:1, pulse width max. 10 s
- Pulse output: pulse value and pulse polarity selectable, max. pulse width configurable (0.05 to 2000 ms)

PROFIBUS DP interface

- Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated
- Profil version 3.0
- Data transmission rate: 9,6 kBaud to 12 MBaud
- Automatic data transmission rate recognition
- Function blocks: 2 $\times$ analog Input, 3 $\times$ totalizer
- Output data: volume flow, calculated mass flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 33
- Bus address adjustable via miniature switches or local display (optional) at the measuring device
- Available output combination $\rightarrow$ 8

PROFIBUS PA interface

- Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
- Profil version 3.0
- Current consumption: 11 mA
- Permissible supply voltage: 9 to 32 V
- Bus connection with integrated reverse polarity protection
- Error current FDE (Fault Disconnection Electronic): 0 mA
- Function blocks: 2 $\times$ analog input, 3 $\times$ totalizer
- Output data: volume flow, calculated mass flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), totalizer control, value for local display
- Cyclic data transmission compatible with previous model Promag 33
- Bus address adjustable via miniature switches or local display (optional) at the measuring device

MODBUS RS485 interface

- Transmission technology (Physical Layer): RS485 in accordance with ANSI/TIA/EIA-485-A: 1998, galvanically isolated
- MODBUS device type: Slave
- Address range: 1 to 247
- Bus address adjustable via miniature switches or local display (optional) at the measuring device
- Supported MODBUS function codes: 03, 04, 06, 08, 16, 23
- Broadcast: supported with the function codes 06, 16, 23
- Übertragungsmodus: RTU oder ASCII
- Supported baudrate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud
- Response time:
 - Direct data access = typically 25 to 50 ms
 - Auto-scan buffer (data range) = typically 3 to 5 ms
- Available output combination $\rightarrow$ 8

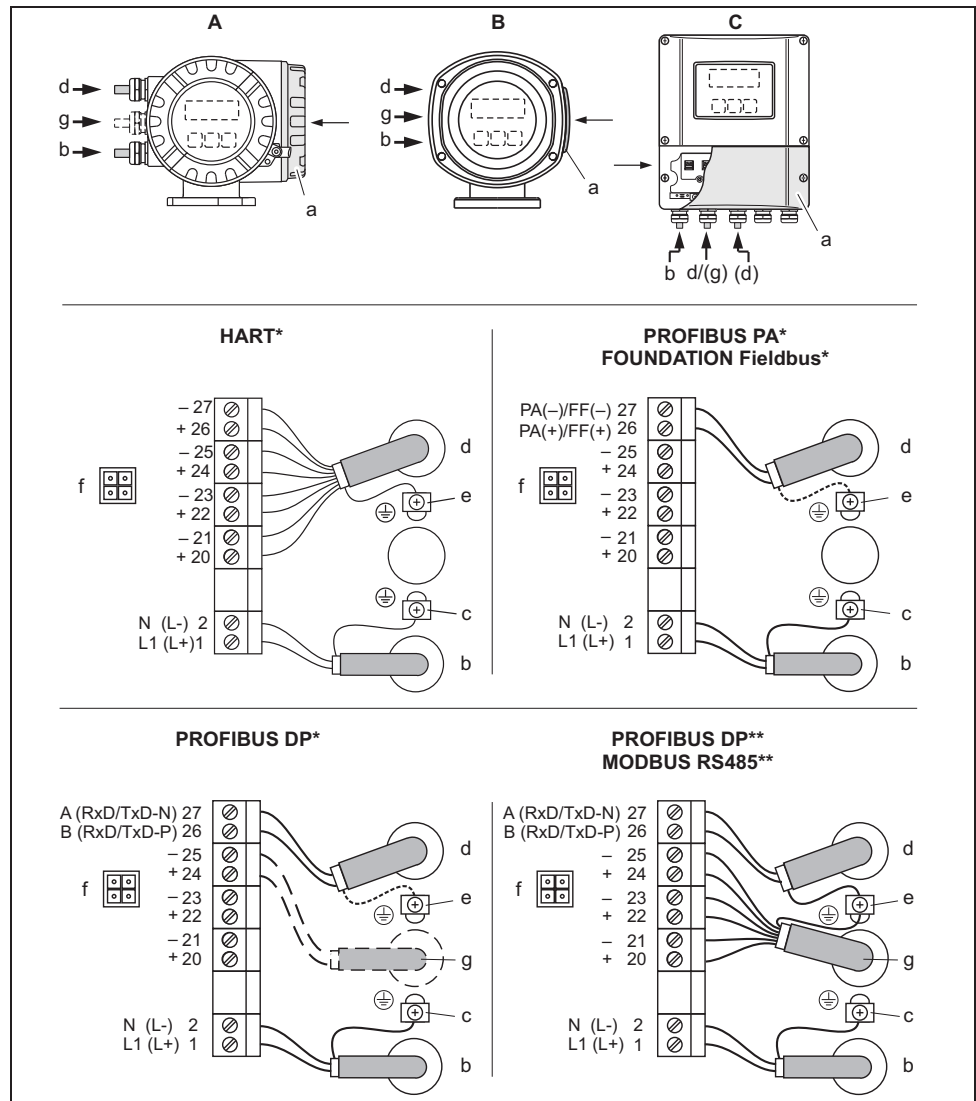
FOUNDATION Fieldbus interface

- FOUNDATION Fieldbus H1
- Transmission technology (Physical Layer): IEC 61158-2 (MBP), galvanically isolated
- ITK version 5.01
- Current consumption: 12 mA
- Error current FDE (Fault Disconnection Electronic): 0 mA
- Bus connection with integrated reverse polarity protection
- Function blocks:
 - 5 × Analog Input (execution time: 18 ms each)
 - 1 × PID (25 ms)
 - 1 × Digital Output (18 ms)
 - 1 × Signal Characterizer (20 ms)
 - 1 × Input Selector (20 ms)
 - 1 × Arithmetic (20 ms)
 - 1 × Integrator (18 ms)
- Output data: volume flow, calculated mass flow, temperature, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), reset totalizer
- Link Master (LM) functionality is supported

Signal on alarm	■ Current output → failure response selectable (e.g. in accordance with NAMUR recommendation NE 43) ■ Pulse/frequency output → failure response selectable ■ Status output (Promag 50) → non-conductive by fault or power supply failure ■ Relay output (Promag 53) → de-energized by fault or power supply failure
Load	see "Output signal"
Low flow cutoff	Switch points for low flow cutoff are selectable.
Galvanic isolation	All circuits for inputs, outputs and power supply are galvanically isolated from each other.
Switching output	Status output (Promag 50, Promag 53) Open collector, max. 30 V DC / 250 mA, galvanically isolated. Configurable for: error messages, Empty Pipe Detection (EPD), flow direction, limit values. Relay outputs (Promag 53) Normally closed (NC or break) or normally open (NO or make) contacts available (default: relay 1 = NO, relay 2 = NC), max. 30 V / 0,5 A AC ; 60 V / 0,1 A DC, galvanically isolated. Configurable for: error messages, Empty Pipe Detection (EPD), flow direction, limit values, batching contacts.

Power supply

Electrical connection,
measuring unit



Connecting the transmitter, cable cross-section max. 2.5 mm² (14 AWG)

- A View A (field housing)
- B View B (stainless steel field housing)
- C View C (wall-mount housing)

*) fixed communication boards

**) flexible communication boards

a Connection compartment cover

b Cable for power supply: 85 to 260 V AC / 20 to 55 V AC / 16 to 62 V DC

- Terminal No. 1: L1 for AC, L+ for DC

- Terminal No. 2: N for AC, L- for DC

c Ground terminal for protective conductor

d Signal cable: see "Electrical connection, terminal assignment" → 8

Fieldbus cable:

- Terminal No. 26: DP (B) / PA + / FF + / MODBUS RS485 (B) / (PA, FF: with polarity protection)

- Terminal No. 27: DP (A) / PA - / FF - / MODBUS RS485 (A) / (PA, FF: with polarity protection)

e Ground terminal for signal cable shield / Fieldbus cable / RS485 line

f Service adapter for connecting service interface FXA193 (Fieldcheck, FieldCare)

g Signal cable: see "Electrical connection, terminal assignment" → 8

Cable for external termination (only for PROFIBUS DP with fixed assignment communication board):

- Terminal No. 24: +5 V

- Terminal No. 25: DGND

**Electrical connection,
terminal assignment****Terminal assignment, Promag 50**

Order variant	Terminal No. (inputs/outputs)			
	20 (+) / 21 (-)	22 (+) / 23 (-)	24 (+) / 25 (-)	26 (+) / 27 (-)
50***_*****W	—	—	—	Current output HART
50***_*****A	—	—	Frequency output	Current output HART
50***_*****D	Status input	Status output	Frequency output	Current output HART
50***_*****H	—	—	—	PROFIBUS PA
50***_*****J	—	—	+5 V (external termination)	PROFIBUS DP
50***_*****S	—	—	Frequency output, Ex i, passive	Current output, Ex i, passive, HART
50***_*****T	—	—	Frequency output, Ex i, passive	Current output, Ex i, passive, HART

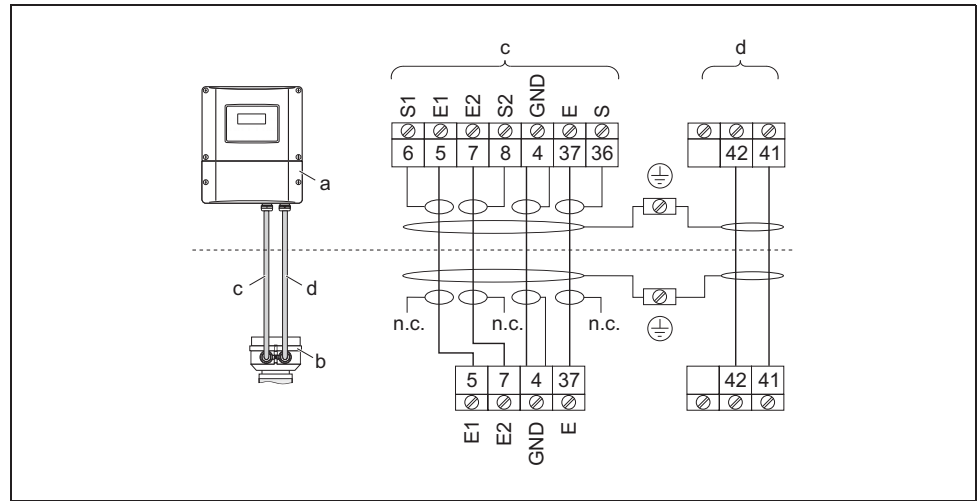
Ground terminal → 7

Terminal assignment, Promag 53

The inputs and outputs on the communication board can be either permanently assigned or variable, depending on the version ordered (see table). Replacements for modules which are defective or which have to be replaced can be ordered as accessories.

Order variant	Terminal No. (inputs/outputs)			
	20 (+) / 21 (-)	22 (+) / 23 (-)	24 (+) / 25 (-)	26 (+) / 27 (-)
Fixed communication boards (fixed assignment)				
53***_*****A	—	—	Frequency output	Current output HART
53***_*****B	Relay output 2	Relay output 1	Frequency output	Current output HART
53***_*****F	—	—	—	PROFIBUS PA, Ex i
53***_*****G	—	—	—	FOUNDATION Fieldbus, Ex i
53***_*****H	—	—	—	PROFIBUS PA
53***_*****J	—	—	—	PROFIBUS DP
53***_*****K	—	—	—	FOUNDATION Fieldbus
53***_*****Q	—	—	Status input	MODBUS RS485
53***_*****S	—	—	Frequency output, Ex i	Current output, Ex i, passive, HART
53***_*****T	—	—	Frequency output, Ex i	Current output, Ex i, passive, HART
Flexible communication boards				
53***_*****C	Relay output 2	Relay output 1	Frequency output	Current output HART
53***_*****D	Status input	Relay output	Frequency output	Current output HART
53***_*****L	Status input	Relay output 2	Relay output 1	Current output HART
53***_*****M	Status input	Frequency output	Frequency output	Current output HART
53***_*****N	Current output	Frequency output	Status input	MODBUS RS485
53***_*****P	Current output	Frequency output	Status input	PROFIBUS DP
53***_*****V	Relay output 2	Relay output 1	Status input	PROFIBUS DP
53***_*****2	Relay output	Current output	Frequency output	Current output HART
53***_*****4	Current input	Relay output	Frequency output	Current output HART
53***_*****7	Relay output 2	Relay output 1	Status input	MODBUS RS485

Ground terminal → 7

**Electrical connection,
remote version****Connecting the remote version**

- a Wall-mount housing connection compartment
- b Sensor connection housing cover
- c Signal cable
- d Coil current cable

n.c. Not connected, insulated cable shields

Terminal no. and cable colors: 6/5 = brown; 7/8 = white; 4 = green; 36/37 = yellow

Supply voltage (power supply)

- 85 to 260 V AC, 45 to 65 Hz
- 20 to 55 V AC, 45 to 65 Hz
- 16 to 62 V DC

PROFIBUS PA and FOUNDATION Fieldbus

- Non-Ex: 9 to 32 V DC
- Ex i: 9 to 24 V DC
- Ex d: 9 to 32 V DC

Cable entry**Power supply and signal cables (inputs/ outputs):**

- Cable entry M20 × 1.5 (8 to 12 mm / 0.31 to 0.47")
- Sensor cable entry for armoured cables M20 × 1.5 (9.5 to 16 mm / 0.37 to 0.63")
- Thread for cable entries, 1/2" NPT, G 1/2"

Connecting cable for remote version:

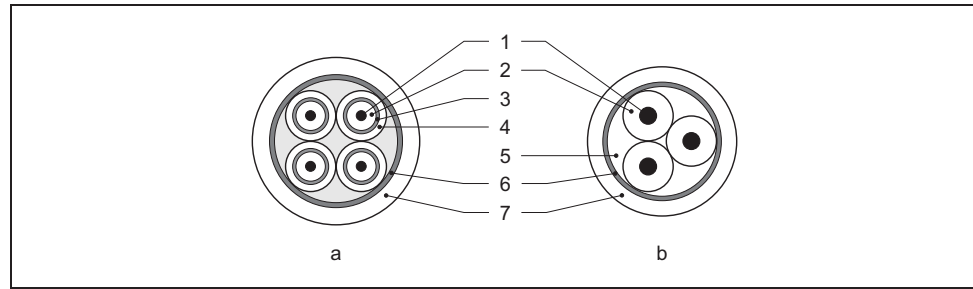
- Cable entry M20 × 1.5 (8 to 12 mm / 0.31 to 0.47")
- Sensor cable entry for armoured cables M20 × 1.5 (9.5 to 16 mm / 0.37 to 0.63")
- Thread for cable entries, 1/2" NPT, G 1/2"

**Remote version cable
specifications****Coil cable**

- 2 × 0.75 mm² (18 AWG) PVC cable with common, braided copper shield (Ø ~ 7 mm / 0.28")
- Conductor resistance: ≤ 37 Ω/km (≤ 0.011 Ω/ft)
- Capacitance core/core, shield grounded: ≤ 120 pF/m (≤ 37 pF/ft)
- Operating temperature: -20 to +80 °C (-68 to +176 °F)
- Cable cross-section: max. 2.5 mm² (14 AWG)
- Test voltage for cable insulation: ≤ 1433 AC r.m.s. 50/60 Hz or ≥ 2026 V DC

Signal cable

- 3 × 0.38 mm² (20 AWG) PVC cable with common, braided copper shield (Ø ~ 7 mm / 0.28") and individual shielded cores
- With empty pipe detection (EPD): 4 × 0.38 mm² (20 AWG) PVC cable with common, braided copper shield (Ø ~ 7 mm / 0.28") and individual shielded cores
- Conductor resistance: ≤ 50 Ω/km (≤ 0.015 Ω/ft)
- Capacitance core/shield: ≤ 420 pF/m (≤ 128 pF/ft)
- Operating temperature: -20 to +80 °C (-68 to +176 °F)
- Cable cross-section: max. 2.5 mm² (14 AWG)



A0003194

- a Signal cable
 b Coil current cable
- 1 Core
 2 Core insulation
 3 Core shield
 4 Core jacket
 5 Core reinforcement
 6 Cable shield
 7 Outer jacket

Operation in zones of severe electrical interference

The measuring device complies with the general safety requirements in accordance with EN 61010 and the EMC requirements of IEC/EN 61326 and NAMUR recommendation NE 21.



Caution!

Grounding is by means of the ground terminals provided for the purpose inside the connection housing. Ensure that the stripped and twisted lengths of cable shield to the ground terminal are as short as possible.

Power consumption

- AC: < 15 VA (incl. sensor)
- DC: < 15 W (incl. sensor)

Switch-on current:

- Max. 3 A (< 5 ms) for 260 V AC
- Max. 13.5 A (< 50 ms) for 24 V DC

Power supply failure

Lasting min. ½ cycle frequency: EEPROM saves measuring system data

- EEPROM or T-DAT (Promag 53 only) retain the measuring system data in the event of a power supply failure
- S-DAT: exchangeable data storage chip which stores the data of the sensor (nominal diameter, serial number, calibration factor, zero point etc.)

Potential equalization



Warning!

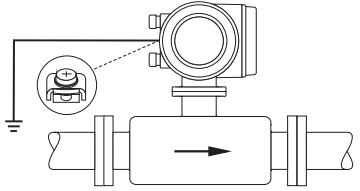
The measuring system must be included in the potential equalization.

Perfect measurement is only ensured when the fluid and the sensor have the same electrical potential. This is ensured by the reference electrode integrated in the sensor as standard.

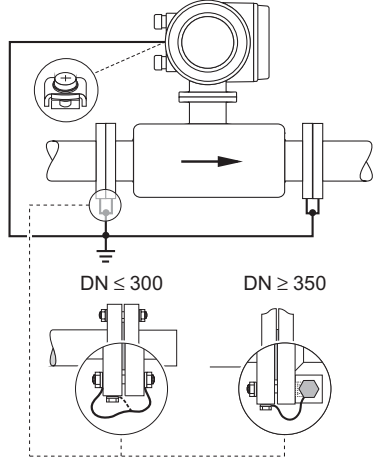
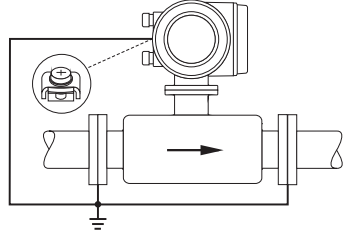
The following should also be taken into consideration for potential equalization:

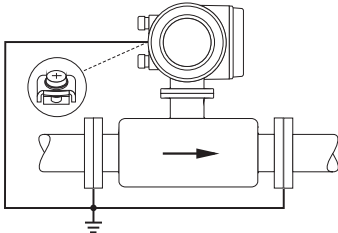
- Internal grounding concepts in the company
- Operating conditions, such as the material/ grounding of the pipes (see table)

Standard situation

Operating conditions	Potential equalization
When using the measuring device in a: ■ Metal, grounded pipe Potential equalization takes place via the ground terminal of the transmitter.  Note! When installing in metal pipes, we recommend you connect the ground terminal of the transmitter housing with the piping.	 A0011892 Via the ground terminal of the transmitter

Special situations

Operating conditions	Potential equalization
When using the measuring device in a: ■ Metal pipe that is not grounded This connection method also applies in situations where: ■ Customary potential equalization cannot be ensured. ■ Excessively high equalizing currents can be expected. Both sensor flanges are connected to the pipe flange by means of a ground cable (copper wire, at least 6 mm² / 0.0093 in²) and grounded. Connect the transmitter or sensor connection housing, as applicable, to ground potential by means of the ground terminal provided for the purpose. ■ DN ≤ 300 (12"): the ground cable is mounted directly on the conductive flange coating with the flange screws. ■ DN ≥ 350 (14"): the ground cable is mounted directly on the transportation metal support.  Note! The ground cable for flange-to-flange connections can be ordered separately as an accessory from Endress+Hauser.	 A0011893 Via the ground terminal of the transmitter and the flanges of the pipe
When using the measuring device in a: ■ Plastic pipe ■ Pipe with insulating lining This connection method also applies in situations where: ■ Customary potential equalization cannot be ensured. ■ Excessively high equalizing currents can be expected. Potential equalization takes place using additional ground disks, which are connected to the ground terminal via a ground cable (copper wire, at least 6 mm² / 0.0093 in²). When installing the ground disks, please comply with the enclosed Installation Instructions.	 A0011895 Via the ground terminal of the transmitter and the optionally available ground disks

Operating conditions	Potential equalization
When using the measuring device in a: ■ Pipe with a cathodic protection unit The device is installed potential-free in the pipe. Only the two flanges of the pipe are connected with a ground cable (copper wire, at least 6 mm² / 0.0093 in²). Here, the ground cable is mounted directly on the conductive flange coating with flange screws. Note the following when installing: ■ The applicable regulations regarding potential-free installation must be observed. ■ There should be no electrically conductive connection between the pipe and the device. ■ The mounting material must withstand the applicable torques.	 Potential equalization and cathodic protection 1 Power supply isolation transformer 2 Electrically isolated

Performance characteristics

Reference operating conditions

As per DIN EN 29104 and VDI/VDE 2641:

- Fluid temperature: $+28\text{ °C} \pm 2\text{ K}$ ($+82\text{ °F} \pm 2\text{ K}$)
- Ambient temperature: $+22\text{ °C} \pm 2\text{ K}$ ($+72\text{ °F} \pm 2\text{ K}$)
- Warm-up period: 30 minutes

Installation conditions:

- Inlet run $> 10 \times \text{DN}$
- Outlet run $> 5 \times \text{DN}$
- Sensor and transmitter grounded.
- The sensor is centered in the pipe.

Maximum measured error

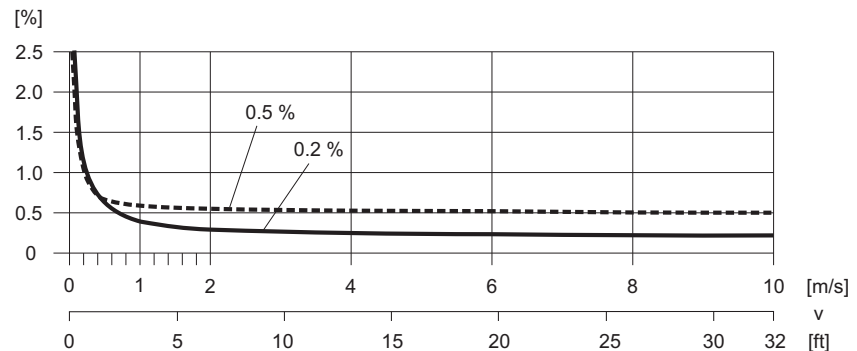
Promag 50:

- Current output: also typically $\pm 5\text{ }\mu\text{A}$
- Pulse output: $\pm 0.5\%$ o.r. $\pm 1\text{ mm/s}$ ($\pm 0.5\%$ o.r. $\pm 0.04\text{ in/s}$)
optional: $\pm 0.2\%$ o.r. $\pm 2\text{ mm/s}$ ($\pm 0.2\%$ o.r. $\pm 0.08\text{ in/s}$) (o.r. = of reading)

Promag 53:

- Current output: also typically $\pm 5\text{ }\mu\text{A}$
- Pulse output: $\pm 0.2\%$ o.r. $\pm 2\text{ mm/s}$ ($\pm 0.2\%$ o.r. $\pm 0.08\text{ in/s}$) (o.r. = of reading)

Fluctuations in the supply voltage do not have any effect within the specified range.



Max. measured error in % of reading

Repeatability

Max. $\pm 0.1\%$ o.r. $\pm 0.5\text{ mm/s}$ ($\pm 0.1\%$ o.r. $\pm 0.02\text{ in/s}$) (o.r. = of reading)

Operating conditions: Installations

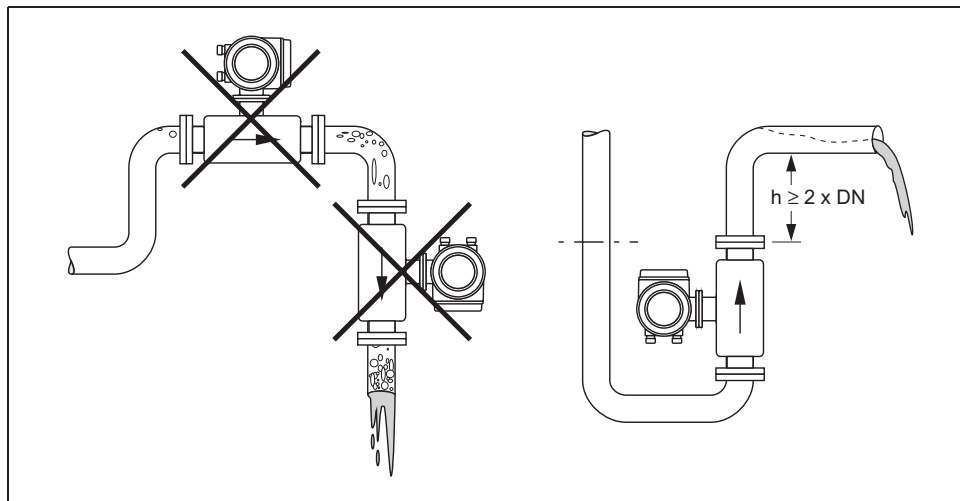
Installation instructions

Mounting location

Entrained air or gas bubble formation in the measuring tube can result in an increase in measuring errors.

Avoid the following installation locations in the pipe:

- Highest point of a pipeline. Risk of air accumulating!
- Directly upstream from a free pipe outlet in a vertical pipeline.



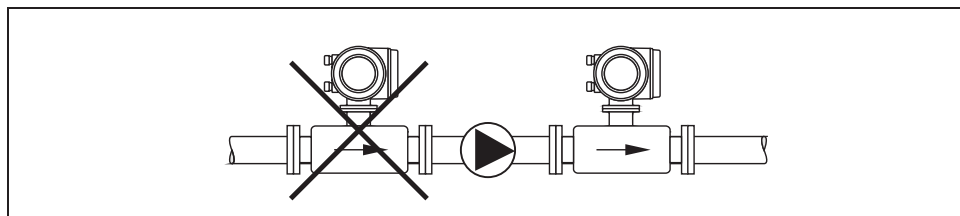
A0011899

Mounting location

Installation of pumps

Sensors may not be installed on the pump suction side. This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. Information on the pressure tightness of the measuring tube lining → 21, Section "Pressure tightness".

Pulsation dampers may be needed when using piston pumps, piston diaphragm pumps or hose pumps. Information on the shock and vibration resistance of the measuring system → 20, Section "Shock and vibration resistance".



A0011900

Installation of pumps

Partially filled pipes

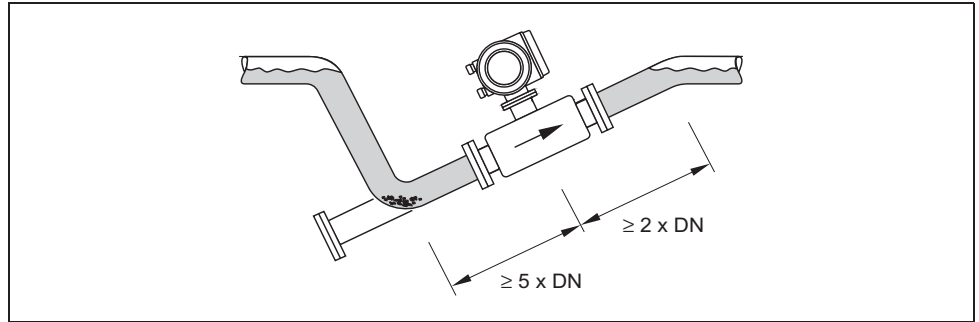
Partially filled pipes with gradients necessitate a drain-type configuration.

The empty pipe detection function (EPD) provides additional security in detecting empty or partially filled pipes.



Caution!

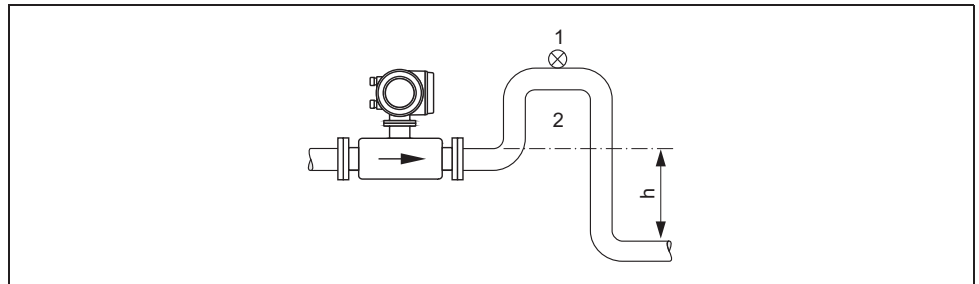
Risk of solids accumulating. Do not install the sensor at the lowest point in the drain. It is advisable to install a cleaning valve.



Installation with partially filled pipes

Down pipes

Install a siphon or a vent valve downstream of the sensor in down pipes $h \geq 5 \text{ m}$ (16.4 ft). This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. This measure also prevents the liquid current stopping in the pipe which could cause air locks. Information on the pressure tightness of the measuring tube lining → 21, Section "Pressure tightness".



Installation measures for vertical pipes

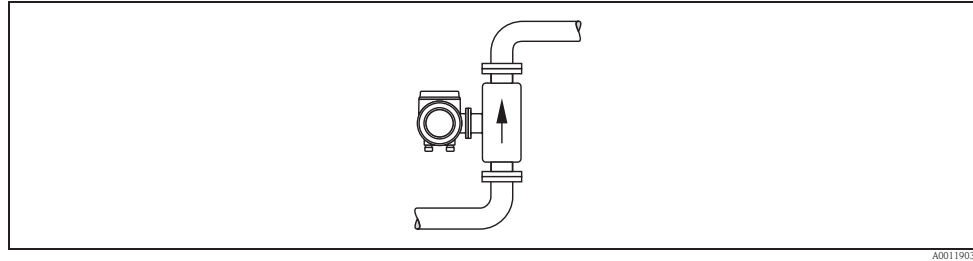
- 1 Vent valve
- 2 Pipe siphon
- h Length of the down pipe

Orientation

An optimum orientation helps avoid gas and air accumulations and deposits in the measuring tube. However, the measuring device also offers the additional function of empty pipe detection (EPD) for detecting partially filled measuring tubes or if outgassing fluids or fluctuating operating pressures are present.

Vertical orientation

This is the ideal orientation for self-emptying piping systems and for use in conjunction with empty pipe detection.



Vertical orientation

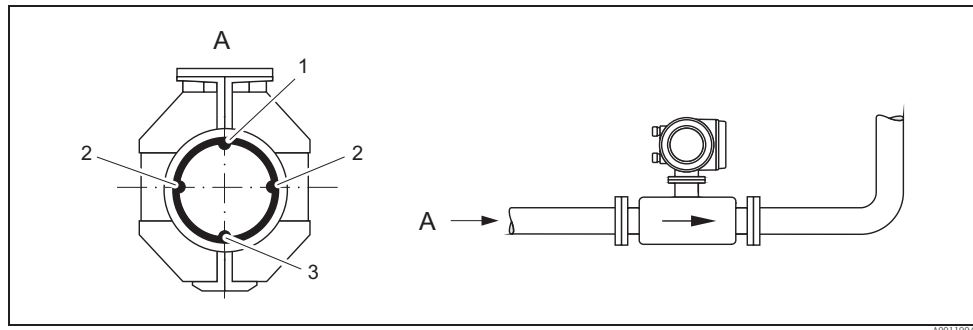
Horizontal orientation

The measuring electrode axis should be horizontal. This prevents brief insulation of the two measuring electrodes by entrained air bubbles.



Caution!

Empty pipe detection only works correctly with horizontal orientation if the transmitter housing is facing upwards. Otherwise there is no guarantee that empty pipe detection will respond if the measuring tube is only partially filled or empty.



Horizontal orientation

- 1 EPD electrode for empty pipe detection
- 2 Measuring electrodes for signal detection
- 3 Reference electrode for potential equalization

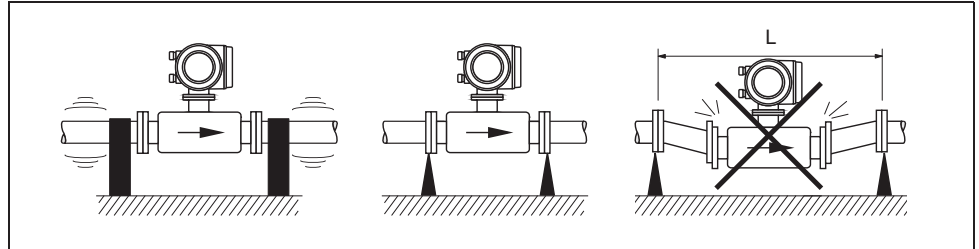
Vibrations

Secure the piping and the sensor if vibration is severe.



Caution!

If vibrations are too severe, we recommend the sensor and transmitter be mounted separately. Information on the permitted shock and vibration resistance → 20, Section "Shock and vibration resistance".



A0011906

Measures to prevent vibration of the measuring device

$L > 10 \text{ m (33 ft)}$

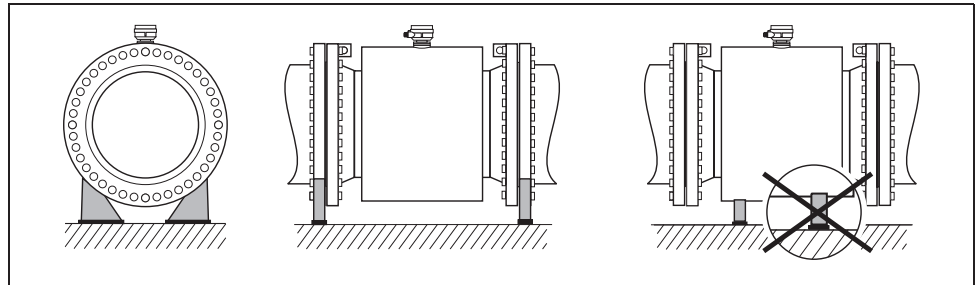
Foundations, supports

If the nominal diameter is $\text{DN} \geq 350$, mount the transmitter on a foundation of adequate load-bearing strength.



Caution!

Do not allow the casing to take the weight of the sensor. This would buckle the casing and damage the internal magnetic coils.



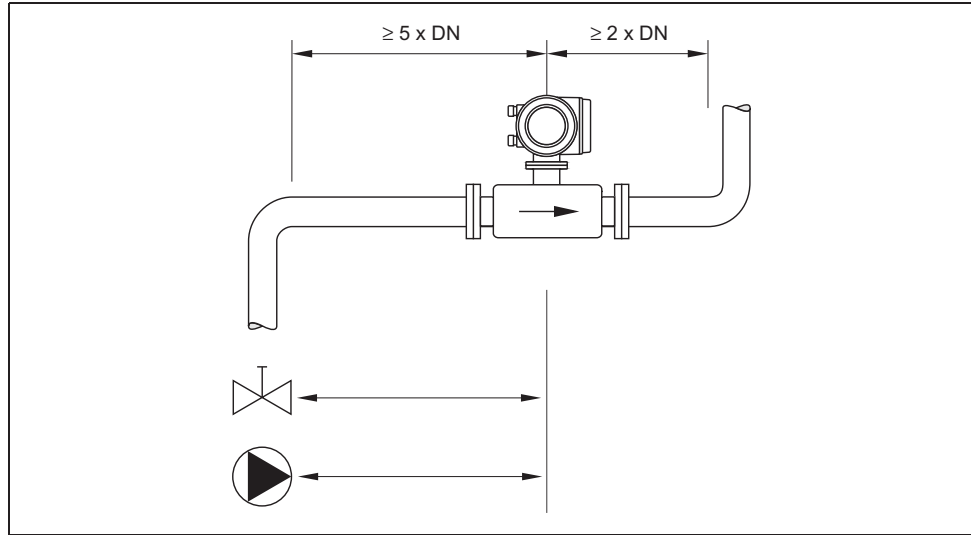
A0003209

Inlet and outlet run

If possible, install the sensor well clear of assemblies such as valves, T-pieces, elbows etc.

Note the following inlet and outlet runs to comply with measuring accuracy specifications:

- Inlet run: $\geq 5 \times \text{DN}$
- Outlet run: $\geq 2 \times \text{DN}$



A0011905

Inlet and outlet run

Adapters

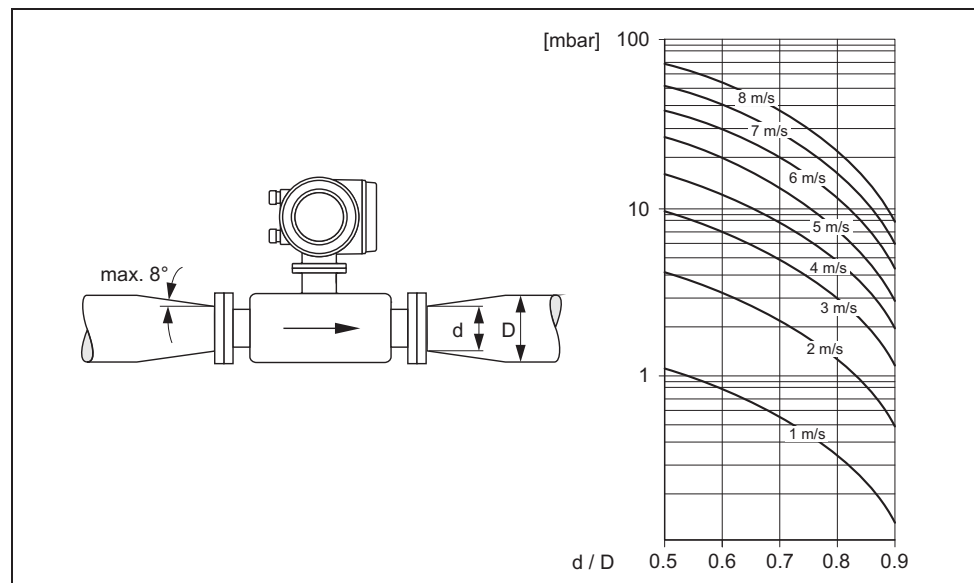
Suitable adapters to DIN EN 545 (double-flange reducers) can be used to install the sensor in larger-diameter pipes. The resultant increase in the rate of flow improves measuring accuracy with very slow-moving fluids. The nomogram shown here can be used to calculate the pressure loss caused by reducers and expanders.



Note!

The nomogram only applies to liquids of viscosity similar to water.

1. Calculate the ratio of the diameters d/D .
2. From the nomogram read off the pressure loss as a function of flow velocity (downstream from the reduction) and the d/D ratio.



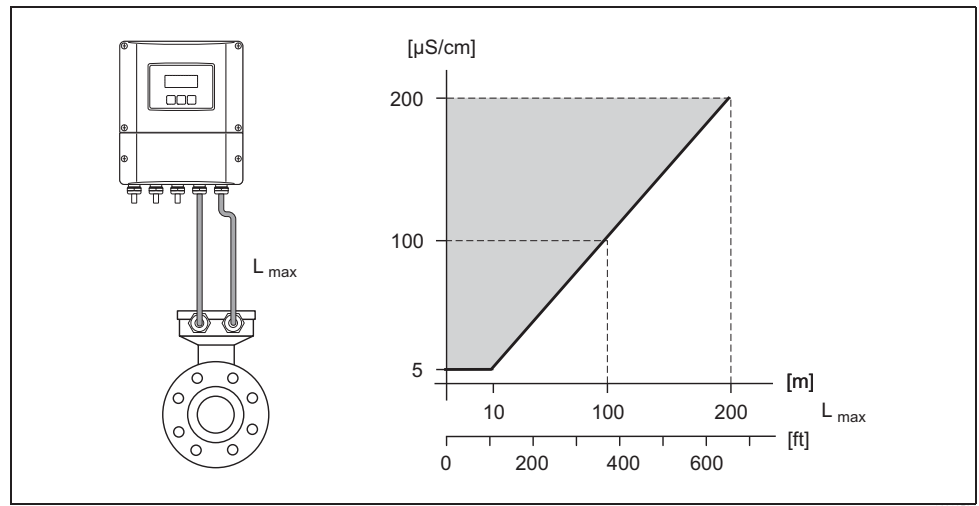
A0011907

Pressure loss due to adapters

Length of connecting cable

When mounting the remote version, please note the following to achieve correct measuring results:

- Fix cable run or lay in armored conduit. Cable movements can falsify the measuring signal especially in the case of low fluid conductivities.
- Route the cable well clear of electrical machines and switching elements.
- If necessary, ensure potential equalization between sensor and transmitter.
- The permitted cable length $L_{\max}$ is determined by the fluid conductivity. A minimum conductivity of $20 \mu\text{S/cm}$ is required for measuring demineralized water.
- When the empty pipe detection function is switched on (EPD), the maximum connecting cable length is 10 m (33 ft).



Permitted length of connecting cable for remote version

Area marked in gray = permitted range; $L_{\max}$ = length of connecting cable in [m] ([ft]); fluid conductivity in $\mu\text{S/cm}$

Operating conditions: Environment

Ambient temperature range



Transmitter

- Standard: -20 to +60 °C (-4 to +140 °F)
- Optional: -40 to +60 °C (-40 to +140 °F)

Note!

At ambient temperatures below -20 °C (-4 °F) the readability of the display may be impaired.

Sensor

- Flange material carbon steel: -10 to +60 °C (14 to +140 °F)
- Flange material stainless steel: -40 to +60 °C (-40 to +140 °F)



Caution!

The permitted temperature range of the measuring tube lining may not be undershot or overshoot

→ 21, Section "Medium temperature range".

Please note the following points:

- Install the device in a shady location. Avoid direct sunlight, particularly in warm climatic regions.
- The transmitter must be mounted separate from the sensor if both the ambient and fluid temperatures are high.

Storage temperature



The storage temperature corresponds to the operating temperature range of the measuring transmitter and the appropriate measuring sensors.

Caution!

- The measuring device must be protected against direct sunlight during storage in order to avoid unacceptably high surface temperatures.
- A storage location must be selected where moisture does not collect in the measuring device. This will help prevent fungus and bacteria infestation which can damage the liner.
- Do not remove the protective plates or caps on the process connections until the device is ready to install.

Degree of protection

- Standard: IP 67 (NEMA 4X) for transmitter and sensor.
- Optional: IP 68 (NEMA 6P) for sensor for remote version.
- For information regarding applications where the device is buried directly in the soil or is installed in a flooded wastewater basin please contact your local Endress+Hauser Sales Center.

Shock and vibration resistance Acceleration up to 2 g following IEC 600 68-2-6

Electromagnetic compatibility (EMC)

- As per IEC/EN 61326 and NAMUR recommendation NE 21.

Operating conditions: Process

Medium temperature range

The permitted temperature depends on the lining of the measuring tube:

- Polyurethane: -20 to +50 °C (-4 to +122 °F) (DN 25 to 1200 / 1 to 48")
- Hard rubber: ±0 to +80 °C (+32 to +176 °F) (DN 50 to 2000 / 2 to 78")

Conductivity

The minimum conductivity is:

- $\geq 5 \mu\text{S}/\text{cm}$ for fluids generally
- $\geq 20 \mu\text{S}/\text{cm}$ for demineralized water



Note!

In the remote version, the necessary minimum conductivity also depends on the cable length
(→ 19, Section "Length of connecting cable").

Medium pressure range (nominal pressure)

- EN 1092-1 (DIN 2501)
 - PN 6 (DN 350 to 2000 / 14 to 78")
 - PN 10 (DN 200 to 2000 / 8 to 78")
 - PN 16 (DN 65 to 2000 / 3 to 78")
 - PN 25 (DN 200 to 1000 / 8 to 40")
 - PN 40 (DN 25 to 150 / 1 to 6")
- ANSI B 16.5
 - Class 150 (DN 1 to 24")
 - Class 300 (DN 1 to 6")
- AWWA
 - Class D (DN 28 to 78")
- JIS B2220
 - 10 K (DN 50 to 300 / 2 to 12")
 - 20 K (DN 25 to 300 / 1 to 12")
- AS 2129
 - Table E (DN 80, 100, 150 to 400, 500, 600 / 3", 4", 6 to 16", 20", 24")
- AS 4087
 - PN 16 (DN 80, 100, 150 to 400, 500, 600 / 3", 4", 6 to 16", 20", 24")

Pressure tightness

Measuring tube lining: Polyurethane

Nominal diameter		Limit values for abs. pressure [mbar] ([psi]) at fluid temperatures:			
		25 °C (77 °F)		50 °C (122 °F)	
[mm]	[inch]	[mbar]	[psi]	[mbar]	[psi]
25 to 1200	1 to 48"	0	0	0	0

Measuring tube lining: Hard rubber

Nominal diameter		Limit values for abs. pressure [mbar] ([psi]) at fluid temperatures:					
		25 °C (77 °F)		50 °C (122 °F)		80 °C (176 °F)	
[mm]	[inch]	[mbar]	[psi]	[mbar]	[psi]	[mbar]	[psi]
50 to 2000	2 to 78"	0	0	0	0	0	0

Limiting flow

The diameter of the pipe and the flow rate determine the nominal diameter of the sensor.

The optimum flow velocity is between 2 to 3 m/s (6.5 to 9.8 ft/s). The velocity of flow (v), moreover, has to be matched to the physical properties of the fluid:

- $v < 2$ m/s (6.5 ft/s): for abrasive fluids such as potter's clay, lime milk, ore slurry etc.
- $v > 2$ m/s (6.5 ft/s): for fluids causing build-up such as wastewater sludges etc.

Flow characteristic values (SI units)					
Diameter		Recommended flow Min./max. full scale value (v ~ 0.3 or 10 m/s)	Factory settings		
[mm]	[inch]		Full scale value Current output (v ~ 2.5 m/s)	Pulse value (~ 2 pulses/s)	Low flow (v ~ 0.04 m/s)
25	1"	9 to 300 dm ³ /min	75 dm ³ /min	0.50 dm ³	1 dm ³ /min
32	–	15 to 500 dm ³ /min	125 dm ³ /min	1.00 dm ³	2 dm ³ /min
40	1½"	25 to 700 dm ³ /min	200 dm ³ /min	1.50 dm ³	3 dm ³ /min
50	2"	35 to 1100 dm ³ /min	300 dm ³ /min	2.50 dm ³	5 dm ³ /min
65	–	60 to 2000 dm ³ /min	500 dm ³ /min	5.00 dm ³	8 dm ³ /min
80	3"	90 to 3000 dm ³ /min	750 dm ³ /min	5.00 dm ³	12 dm ³ /min
100	4"	145 to 4700 dm ³ /min	1200 dm ³ /min	10.00 dm ³	20 dm ³ /min
125	–	220 to 7500 dm ³ /min	1850 dm ³ /min	15.00 dm ³	30 dm ³ /min
150	6"	20 to 600 m ³ /h	150 m ³ /h	0.025 m ³	2.5 m ³ /h
200	8"	35 to 1100 m ³ /h	300 m ³ /h	0.05 m ³	5.0 m ³ /h
250	10"	55 to 1700 m ³ /h	500 m ³ /h	0.05 m ³	7.5 m ³ /h
300	12"	80 to 2400 m ³ /h	750 m ³ /h	0.10 m ³	10 m ³ /h
350	14"	110 to 3300 m ³ /h	1000 m ³ /h	0.10 m ³	15 m ³ /h
375	15"	140 to 4200 m ³ /h	1200 m ³ /h	0.15 m ³	20 m ³ /h
400	16"	140 to 4200 m ³ /h	1200 m ³ /h	0.15 m ³	20 m ³ /h
450	18"	180 to 5400 m ³ /h	1500 m ³ /h	0.25 m ³	25 m ³ /h
500	20"	220 to 6600 m ³ /h	2000 m ³ /h	0.25 m ³	30 m ³ /h
600	24"	310 to 9600 m ³ /h	2500 m ³ /h	0.30 m ³	40 m ³ /h
700	28"	420 to 13500 m ³ /h	3500 m ³ /h	0.50 m ³	50 m ³ /h
–	30"	480 to 15000 m ³ /h	4000 m ³ /h	0.50 m ³	60 m ³ /h
800	32"	550 to 18000 m ³ /h	4500 m ³ /h	0.75 m ³	75 m ³ /h
900	36"	690 to 22500 m ³ /h	6000 m ³ /h	0.75 m ³	100 m ³ /h
1000	40"	850 to 28000 m ³ /h	7000 m ³ /h	1.00 m ³	125 m ³ /h
–	42"	950 to 30000 m ³ /h	8000 m ³ /h	1.00 m ³	125 m ³ /h
1200	48"	1250 to 40000 m ³ /h	10000 m ³ /h	1.50 m ³	150 m ³ /h
–	54"	1550 to 50000 m ³ /h	13000 m ³ /h	1.50 m ³	200 m ³ /h
1400	–	1700 to 55000 m ³ /h	14000 m ³ /h	2.00 m ³	225 m ³ /h
–	60"	1950 to 60000 m ³ /h	16000 m ³ /h	2.00 m ³	250 m ³ /h
1600	–	2200 to 70000 m ³ /h	18000 m ³ /h	2.50 m ³	300 m ³ /h
–	66"	2500 to 80000 m ³ /h	20500 m ³ /h	2.50 m ³	325 m ³ /h
1800	72"	2800 to 90000 m ³ /h	23000 m ³ /h	3.00 m ³	350 m ³ /h
–	78"	3300 to 100000 m ³ /h	28500 m ³ /h	3.50 m ³	450 m ³ /h
2000	–	3400 to 110000 m ³ /h	28500 m ³ /h	3.50 m ³	450 m ³ /h

Flow characteristic values (US units)					
Diameter		Recommended flow rate Min./max. full scale value (v ~ 0.3 or 10 m/s)	Factory settings		
[inch]	[mm]		Full scale value Current output (v ~ 2.5 m/s)	Pulse value (~ 2 pulses/s)	Low flow (v ~ 0.04 m/s)
1"	25	2.5 to 80 gal/min	18 gal/min	0.20 gal	0.25 gal/min
–	32	4 to 130 gal/min	30 gal/min	0.20 gal	0.50 gal/min
1½"	40	7 to 190 gal/min	50 gal/min	0.50 gal	0.75 gal/min
2"	50	10 to 300 gal/min	75 gal/min	0.50 gal	1.25 gal/min
–	65	16 to 500 gal/min	130 gal/min	1 gal	2.0 gal/min
3"	80	24 to 800 gal/min	200 gal/min	2 gal	2.5 gal/min
4"	100	40 to 1250 gal/min	300 gal/min	2 gal	4.0 gal/min
–	125	60 to 1950 gal/min	450 gal/min	5 gal	7.0 gal/min
6"	150	90 to 2650 gal/min	600 gal/min	5 gal	12 gal/min
8"	200	155 to 4850 gal/min	1200 gal/min	10 gal	15 gal/min
10"	250	250 to 7500 gal/min	1500 gal/min	15 gal	30 gal/min
12"	300	350 to 10600 gal/min	2400 gal/min	25 gal	45 gal/min
14"	350	500 to 15000 gal/min	3600 gal/min	30 gal	60 gal/min
15"	375	600 to 19000 gal/min	4800 gal/min	50 gal	60 gal/min
16"	400	600 to 19000 gal/min	4800 gal/min	50 gal	60 gal/min
18"	450	800 to 24000 gal/min	6000 gal/min	50 gal	90 gal/min
20"	500	1000 to 30000 gal/min	7500 gal/min	75 gal	120 gal/min
24"	600	1400 to 44000 gal/min	10500 gal/min	100 gal	180 gal/min
28"	700	1900 to 60000 gal/min	13500 gal/min	125 gal	210 gal/min
30"	–	2150 to 67000 gal/min	16500 gal/min	150 gal	270 gal/min
32"	800	2450 to 80000 gal/min	19500 gal/min	200 gal	300 gal/min
36"	900	3100 to 100000 gal/min	24000 gal/min	225 gal	360 gal/min
40"	1000	3800 to 125000 gal/min	30000 gal/min	250 gal	480 gal/min
42"	–	4200 to 135000 gal/min	33000 gal/min	250 gal	600 gal/min
48"	1200	5500 to 175000 gal/min	42000 gal/min	400 gal	600 gal/min
54"	–	9 to 300 Mgal/min	75 Mgal/min	0.0005 Mgal	1.3 Mgal/min
–	1400	10 to 340 Mgal/min	85 Mgal/min	0.0005 Mgal	1.3 Mgal/min
60"	–	12 to 380 Mgal/min	95 Mgal/min	0.0005 Mgal	1.3 Mgal/min
–	1600	13 to 450 Mgal/min	110 Mgal/min	0.0008 Mgal	1.7 Mgal/min
66"	–	14 to 500 Mgal/min	120 Mgal/min	0.0008 Mgal	2.2 Mgal/min
72"	1800	16 to 570 Mgal/min	140 Mgal/min	0.0008 Mgal	2.6 Mgal/min
78"	–	18 to 650 Mgal/min	175 Mgal/min	0.001 Mgal	3.0 Mgal/min
–	2000	20 to 700 Mgal/min	175 Mgal/min	0.001 Mgal	3.0 Mgal/min

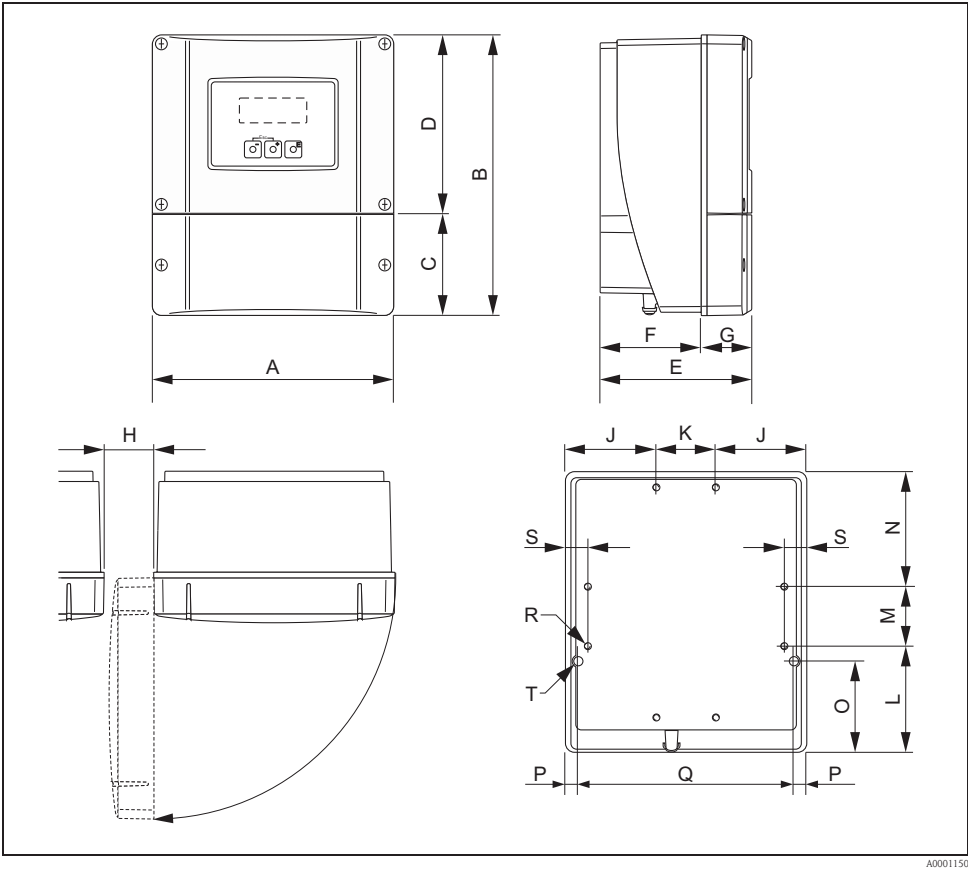
Pressure loss

- No pressure loss if the sensor is installed in a pipe with the same nominal diameter.
- Pressure losses for configurations incorporating adapters according to DIN EN 545 (→ 18, Section "Adapters").

Mechanical construction

Design, dimensions

Transmitter remote version, wall-mount housing (non Ex-zone and II3G/Zone 2)



A0001150

Dimensions (SI units)

A	B	C	D	E	F	G	H	J
215	250	90.5	159.5	135	90	45	> 50	81
K	L	M	N	O	P	Q	R	S
53	95	53	102	81.5	11.5	192	8 × M5	20

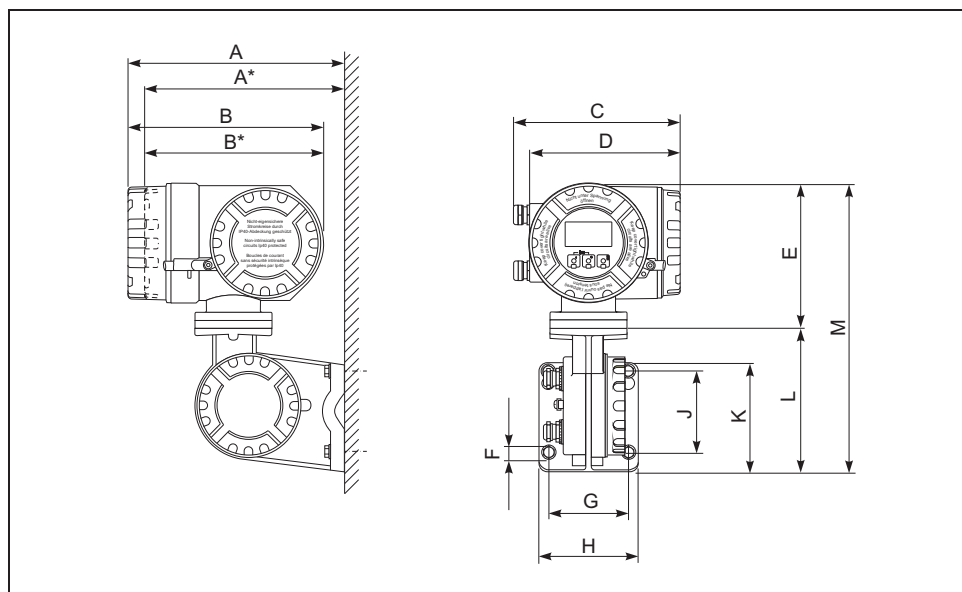
All dimensions in [mm]

Dimensions (US units)

A	B	C	D	E	F	G	H	J
8.46	9.84	3.56	6.27	5.31	3.54	1.77	> 1.97	3.18
K	L	M	N	O	P	Q	R	S
2.08	3.74	2.08	4.01	3.20	0.45	7.55	8 × M5	0.79

All dimensions in [inch]

Transmitter remote version, connection housing (II2GD/Zone 1)



A0002128

Dimensions (SI units)

A	A*	B	B*	C	D	E	Ø F	G	H	J	K	L	M
265	242	240	217	206	186	178	8.6 (M8)	100	130	100	144	170	355

All dimensions in [mm]

Dimensions (US units)

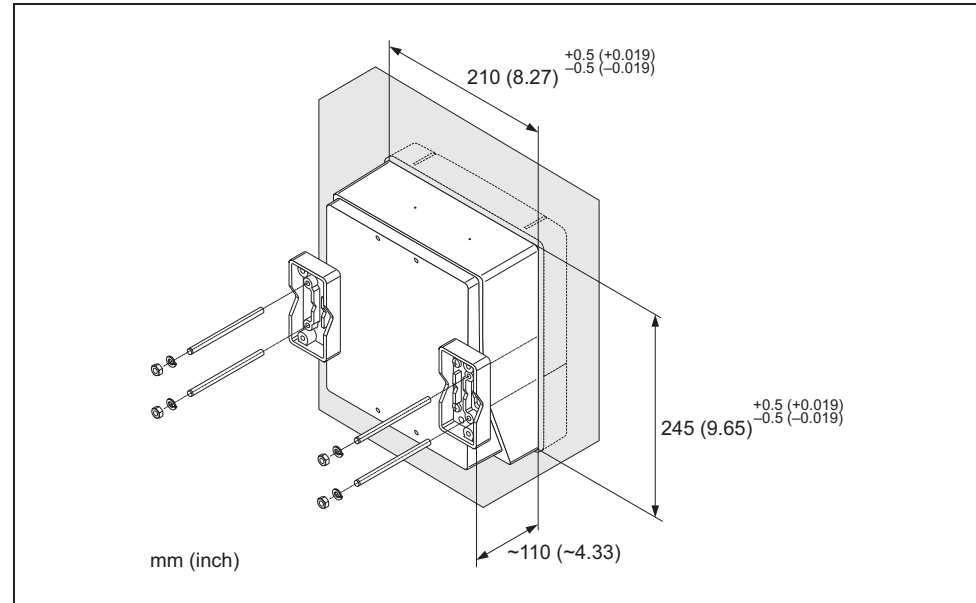
A	A*	B	B*	C	D	E	Ø F	G	H	J	K	L	M
10.4	9.53	9.45	8.54	8.11	7.32	7.01	0.34 (M8)	3.94	5.12	3.94	5.67	6.69	14.0

All dimensions in [inch]

There is a separate mounting kit for the wall-mounted housing. It can be ordered from Endress+Hauser as an accessory. The following installation variants are possible:

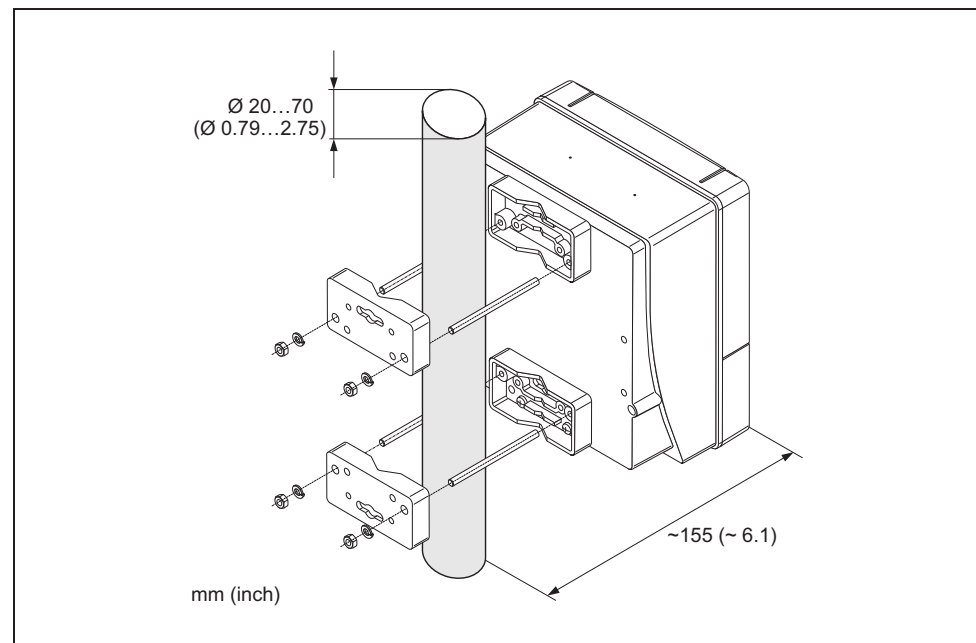
- Panel-mounted installation
- Pipe mounting

Installation in control panel

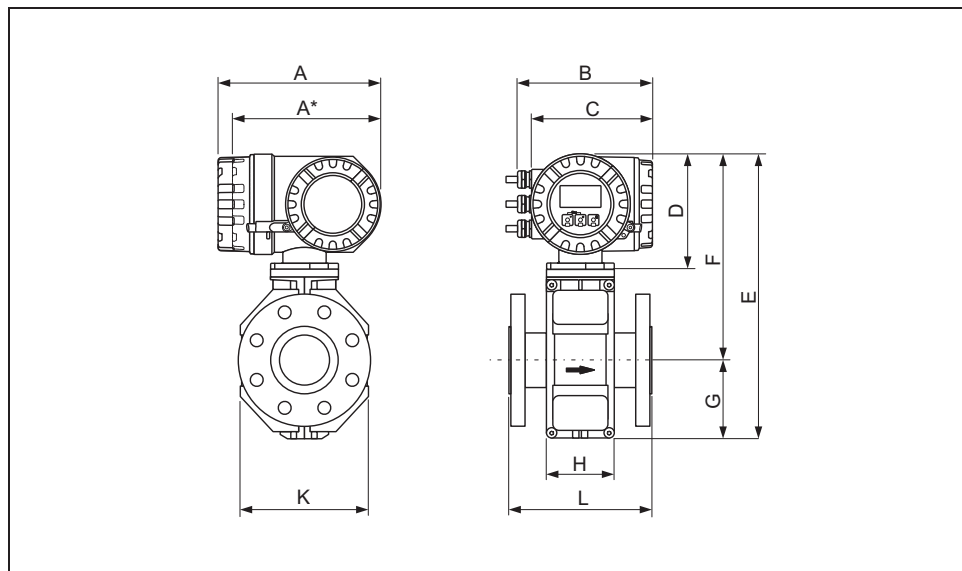


A0001131

Pipe mounting



A0001132

Compact version DN ≤ 300 (12")

A0005423

Dimensions (SI units)

DN EN (DIN) / JIS / AS ²⁾	L ¹⁾	A	A*	B	C	D	E	F	G	H	K
25	200	227	207	187	168	160	341	257	84	94	120
32	200						341	257	84	94	120
40	200						341	257	84	94	120
50	200						341	257	84	94	120
65	200						391	282	109	94	180
80	200						391	282	109	94	180
100	250						391	282	109	94	180
125	250						472	322	150	140	260
150	300						472	322	150	140	260
200	350						527	347	180	156	324
250	450						577	372	205	166	400
300	500						627	397	230	166	460

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.

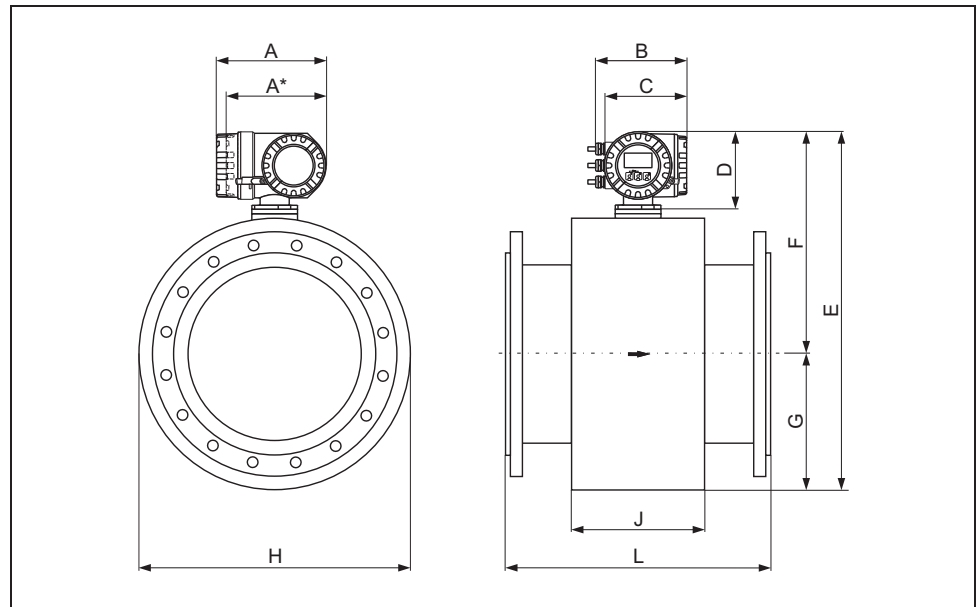
²⁾ For flanges to AS, only the nominal diameters DN 80, 100 and 150 to 300 are available.

All dimensions in [mm]

Dimensions (US units)

DN ANSI	L ¹⁾	A	A*	B	C	D	E	F	G	H	K
1"	7.87	8.94	8.15	7.36	6.61	6.30	13.4	10.1	3.31	3.70	4.72
1½"	7.87						13.4	10.1	3.31	3.70	4.72
2"	7.87						13.4	10.1	3.31	3.70	4.72
3"	7.87						15.4	11.1	4.29	3.70	7.09
4"	9.84						15.4	11.1	4.29	3.70	7.09
6"	11.8						18.6	12.7	5.91	5.51	10.2
8"	13.8						20.8	13.7	7.09	6.14	12.8
10"	17.7						22.7	14.7	8.07	6.14	15.8
12"	19.7						24.7	15.6	9.06	6.54	18.1

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.
All dimensions in [inch]

Compact version DN ≥ 350 (14")

A0005424

Dimensions (SI units)

DN EN (DIN) / AS ²⁾	L ¹⁾	A	A*	B	C	D	E	F	G	H	J
350	550	227	207	187	168	160	738.5	456.5	282.0	276	564
375	600						790.5	482.5	308.0	276	616
400	600						790.5	482.5	308.0	276	616
450	650						840.5	507.5	333.0	292	666
500	650						891.5	533.0	358.5	292	717
600	780						995.5	585.0	410.5	402	821
700	910						1198.5	686.5	512.0	589	1024
750	975						1198.5	686.5	512.0	626	1024
800	1040						1241.5	708.5	533.5	647	1067
900	1170						1394.5	784.5	610.0	785	1220
1000	1300						1546.5	860.5	686.0	862	1372
1050	1365						1598.5	886.5	712.0	912	1424
1200	1560						1796.5	985.5	811.0	992	1622
1350	1755						1998.5	1086.5	912.0	1252	1824
1400	1820						2148.5	1161.5	987.0	1252	1974
1500	1950						2196.5	1185.5	1011.0	1392	2022
1600	2080						2286.5	1230.5	1056.0	1482	2112
1650	2145						2360.5	1267.5	1093.0	1482	2186
1800	2340						2550.5	1362.5	1188.0	1632	2376
2000	2600						2650.5	1412.5	1238.0	1732	2476

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.²⁾ For flanges to AS, only DN 350, 400, 500 and 600 are available.

All dimensions in [mm]

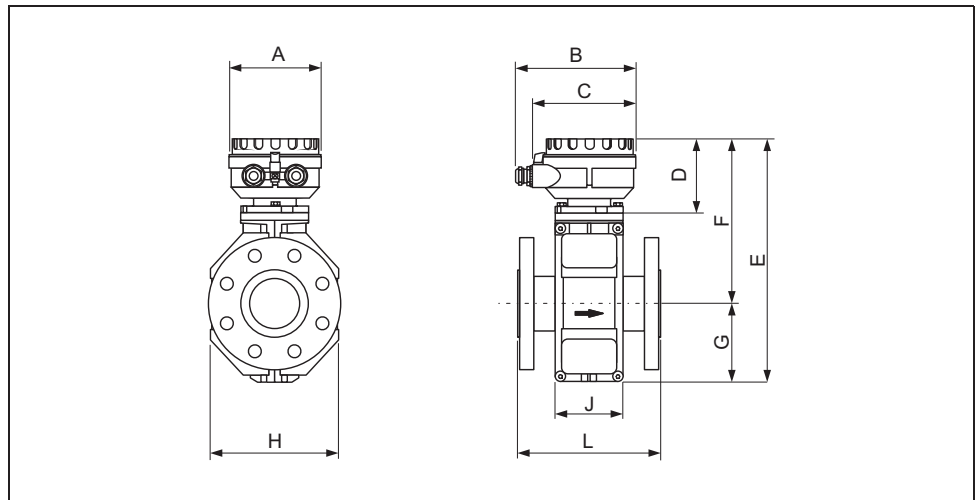
Dimensions (US units)

DN ANSI / AWWA ²⁾	L ¹⁾	A	A*	B	C	D	E	F	G	H	J
14"	21.6	8.94	8.15	7.36	6.61	6.30	29.1	17.9	11.1	10.9	22.2
15"	23.6						31.1	18.9	12.1	10.9	24.2
16"	23.6						31.1	18.9	12.1	10.9	24.2
18"	25.6						33.1	19.9	13.1	11.5	26.2
20"	25.6						35.1	20.9	14.1	11.5	28.2
24"	30.7						39.2	23.0	16.2	15.8	32.3
28"	35.8						47.2	27.0	20.1	23.2	40.3
30"	38.4						47.2	27.0	20.1	24.6	40.3
32"	40.9						48.9	27.9	21.0	25.5	42.0
36"	46.0						54.9	30.9	24.0	30.9	48.0
40"	51.2						60.9	33.9	27.0	33.9	54.0
42"	53.7						62.9	34.9	28.0	35.9	56.0
48"	61.4						71.7	38.8	31.9	39.0	63.8
54"	69.1						78.7	42.8	35.9	42.3	71.8
56"	71.7						84.6	45.7	38.9	49.3	77.7
60"	76.8						86.5	46.7	39.8	54.8	79.6
64"	81.9						90.0	48.4	41.6	58.4	83.2
66"	84.4						92.9	49.9	43.0	58.4	86.0
72"	92.1						100.4	53.6	46.8	64.2	93.5
78"	102.3						104.3	55.6	48.7	68.2	97.5

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.

²⁾ Flanges ≤ 24" only to ANSI available, ≥ 28" only to AWWA available.

All dimensions in [inch]

Sensor, remote version DN ≤ 300 (12")

A0012462

Dimensions (SI units)

DN EN (DIN) / JIS / AS ²⁾	L ¹⁾	A	B	C	D	E	F	G	H	J
25	200	129	163	143	102	286	202	84	120	94
32	200	129	163	143	102	286	202	84	120	94
40	200	129	163	143	102	286	202	84	120	94
50	200	129	163	143	102	286	202	84	120	94
65	200	129	163	143	102	336	227	109	180	94
80	200	129	163	143	102	336	227	109	180	94
100	250	129	163	143	102	336	227	109	180	94
125	250	129	163	143	102	417	267	150	260	140
150	300	129	163	143	102	417	267	150	260	140
200	350	129	163	143	102	472	292	180	324	156
250	450	129	163	143	102	522	317	205	400	166
300	500	129	163	143	102	572	342	230	460	166

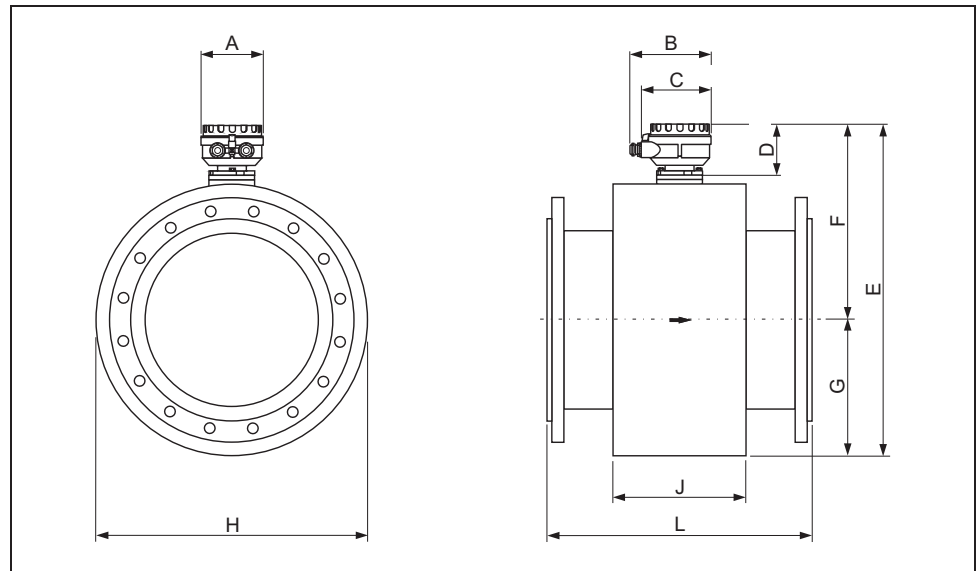
¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.

²⁾ For flanges to AS, only the nominal diameters DN 80, 100 and 150 to 300 are available.
All dimensions in [mm]

Dimensions (US units)

DN ANSI	L ¹⁾	A	B	C	D	E	F	G	H	J
1"	7.87	5.08	6.42	5.63	4.02	11.3	7.95	3.32	4.72	3.70
1½"	7.87	5.08	6.42	5.63	4.02	11.3	7.95	3.32	4.72	3.70
2"	7.87	5.08	6.42	5.63	4.02	11.3	7.95	3.32	4.72	3.70
3"	7.87	5.08	6.42	5.63	4.02	13.2	8.94	4.30	7.10	3.70
4"	9.84	5.08	6.42	5.63	4.02	13.2	8.94	4.30	7.10	3.70
6"	11.8	5.08	6.42	5.63	4.02	16.4	10.5	5.91	10.2	5.51
8"	13.8	5.08	6.42	5.63	4.02	18.6	11.5	7.10	12.8	6.14
10"	17.7	5.08	6.42	5.63	4.02	20.6	12.5	8.08	15.8	6.14
12"	19.7	5.08	6.42	5.63	4.02	22.5	13.5	9.06	18.1	6.54

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.
All dimensions in [inch]

Sensor, remote version DN ≥ 350 (14")

A0003220

Dimensions (SI units)

DN EN (DIN) / AS ²⁾	L ¹⁾	A	B	C	D	E	F	G	H	J
350	550	129	163	143	102	683.5	401.5	282.0	564	276
375	600					735.5	427.5	308.0	616	276
400	600					735.5	427.5	308.0	616	276
450	650					785.5	452.5	333.0	666	292
500	650					836.5	478.0	358.5	717	292
600	780					940.5	530.0	410.5	821	402
700	910					1143.5	631.5	512.0	1024	589
750	975					1143.5	631.5	512.0	1024	626
800	1040					1186.5	653.0	533.5	1067	647
900	1170					1339.5	729.5	610.0	1220	785
1000	1300					1491.5	805.5	686.0	1372	862
1050	1365					1543.5	831.5	712.0	1424	912
1200	1560					1741.5	930.5	811.0	1622	992
1350	1755					1943.5	1031.5	912.0	1824	1252
1400	1820					2093.5	1106.5	987.0	1974	1252
1500	1950					2141.5	1130.5	1011.0	2022	1392
1600	2080					2231.5	1175.5	1056.0	2112	1482
1650	2145					2305.5	1212.5	1093.0	2186	1482
1800	2340					2495.5	1307.5	1188.0	2376	1632
2000	2600					2595.5	1357.5	1238.0	2476	1732

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.²⁾ For flanges to AS, only DN 350, 400, 500 and 600 are available.

All dimensions in [mm]

Dimensions (US units)

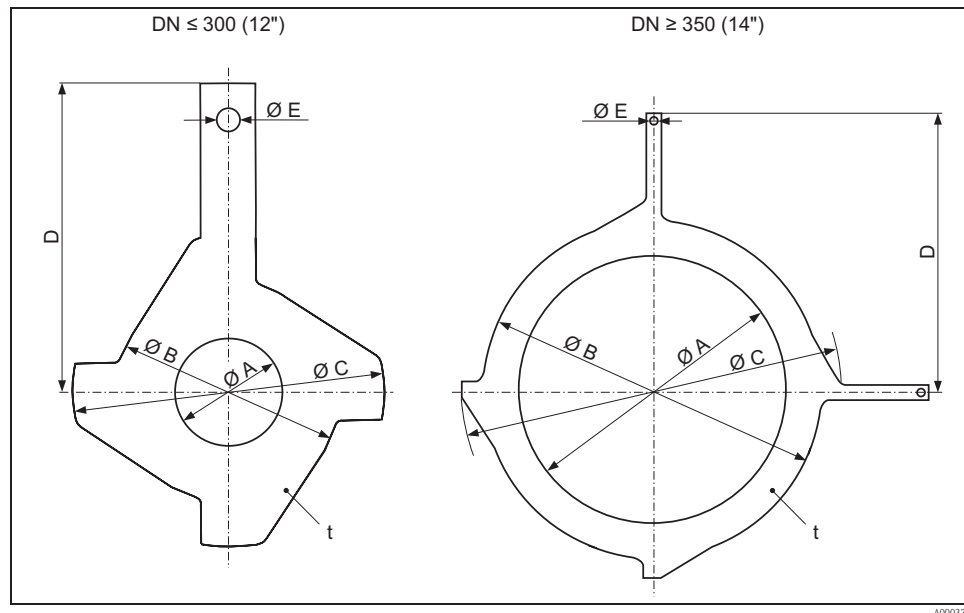
DN ANSI / AWWA ²⁾	L ¹⁾	A	B	C	D	E	F	G	H	J
14"	21.6	5.08	6.42	5.63	4.02	29.1	15.8	11.1	22.2	10.9
15"	23.6					31.1	16.8	12.1	24.2	10.9
16"	23.6					31.1	16.8	12.1	24.2	10.9
18"	25.6					33.1	17.8	13.1	26.2	11.5
20"	25.6					35.1	18.8	14.1	28.2	11.5
24"	30.7					39.2	20.9	16.2	32.3	15.8
28"	35.8					45.0	24.9	20.1	40.3	23.2
30"	38.4					45.0	24.9	20.1	40.3	24.6
32"	40.9					46.7	25.7	21.0	42.0	25.5
36"	46.0					52.7	28.7	24.0	48.0	30.9
40"	51.2					58.7	31.7	27.0	54.0	33.9
42"	53.7					60.7	32.7	28.0	56.0	35.9
48"	61.4					68.5	36.6	31.9	63.8	39.0
54"	69.1					76.5	40.6	35.9	71.8	42.3
56"	71.7					82.4	43.6	38.9	77.7	49.3
60"	76.8					84.3	44.5	39.8	79.6	54.8
64"	81.9					87.9	46.3	41.6	83.2	58.4
66"	84.4					90.8	47.7	43.0	86.0	58.4
72"	92.1					98.2	51.5	46.8	93.5	64.2
78"	102.3					102.2	53.4	48.7	97.5	68.2

¹⁾ The length is regardless of the pressure rating selected. Fitting length to DVGW.

²⁾ Flanges ≤ 24" only to ANSI available, ≥ 28" only to AWWA available.

All dimensions in [inch]

Ground disk for flange connections



A0003221

Dimensions (SI units)

DN ¹⁾ EN (DIN) / JIS / AS ²⁾	A	B	C	D	E	t
25	26	62	77.5	87.5	6.5	2
32	35	80	87.5	94.5		
40	41	82	101	103		
50	52	101	115.5	108		
65	68	121	131.5	118		
80	80	131	154.5	135		
100	104	156	186.5	153		
125	130	187	206.5	160		
150	158	217	256	184		
200	206	267	288	205		
250	260	328	359	240		
300 ³⁾	312	375	413	273		
300 ⁴⁾	310	375	404	268		
350 ³⁾	343	433	479	365	9.0	2
375 ³⁾	393	480	542	395		
400 ³⁾	393	480	542	395		
450 ³⁾	439	538	583	417		
500 ³⁾	493	592	650	460		
600 ³⁾	593	693	766	522		

¹⁾ Ground disks can be used for all flange standards/pressure ratings that can be delivered, except for DN ≥ 300.

²⁾ Only DN 32, 40, 65 and 125 are available for flanges according to AS.

³⁾ PN 10/16

⁴⁾ PN 25, JIS 10K/20K

All dimensions in [mm]

Dimensions (US units)

DN ¹⁾ ANSI	A	B	C	D	E	t
1"	1.02	2.44	3.05	3.44	0.26	0.08
1½"	1.61	3.23	3.98	4.06		
2"	2.05	3.98	4.55	4.25		
3"	3.15	5.16	6.08	5.31		
4"	4.09	6.14	7.34	6.02		
6"	6.22	8.54	10.08	7.24		
8"	8.11	10.5	11.3	8.07		
10"	10.2	12.9	14.1	9.45		
12"	12.3	14.8	16.3	10.8		
14"	13.5	17.1	18.9	14.4		
15"	15.45	18.9	21.3	15.6	0.35	
16"	15.45	18.9	21.3	15.6		
18"	17.3	21.2	23.0	16.4		
20"	19.4	23.3	25.6	18.1		
24"	23.4	27.3	30.1	20.6		

¹⁾ Ground disks can be used for all flange standards/pressure ratings.
All dimensions in [inch]

Weight**Weight in SI units**

Weight data in kg									
Nominal diameter		Compact version			Remote version (without cable)				Transmitter
[mm]	[inch]	EN (DIN) / AS ¹⁾	JIS	ANSI / AWWA	EN (DIN) / AS ¹⁾	JIS	ANSI / AWWA	Wall-mount housing	
25	1"	PN 40	7.3	7.3	PN 40	5.3	5.3		
32	–		8.0	7.3		6.0	5.3		
40	1½"		9.4	8.3		7.4	6.3		
50	2"		10.6	9.3		8.6	7.3		
65	–	PN 16	12	11.1	PN 16	10.0	9.1		
80	3"		14	112.5		12.0	10.5		
100	4"		16	14.7		14.0	12.7		
125	–		21.5	21.0		19.5	19.0		
150	6"	PN 10	25.5	24.5	PN 10	23.5	22.5	Class 150	
200	8"		45	41.9		43	39.9		
250	10"		65	69.4		63	67.4		
300	12"		70	72.3		68	70.3		
350	14"	PN 6			Class 150	103	173	Class 150	6.0
375	15"					118	–		
400	16"					118	203		
450	18"					159	253		
500	20"					154	283		
600	24"					206	403		
700	28"					302	398		
–	30"					–	458		
800	32"					355	548		
900	36"					483	798		
1000	40"					587	898		
–	42"					–	1098		
1200	48"					848	1398		
–	54"					–	2198		
1400	–					1298	–		
–	60"					–	2698		
1600	–					1698	–		
–	66"					–	3698		
1800	72"					2198	4098		
–	78"					–	4598		
2000	–					2798	–		

¹⁾ For flanges to AS, only DN 80, 100, 150 to 400, 500 and 600 are available.

- Transmitter (compact version): 3.4 kg
- Weight data valid for standard pressure ratings and without packaging material.

Weight in US units (only ANSI / AWWA)

Weight data in lbs					
Nominal diameter		Compact version		Remote version (without cable)	
[mm]	[inch]	ANSI / AWWA		Sensor ANSI / AWWA	Transmitter Wall-mount housing
25	1"	Class 150	16.1	Class 150	11.7
40	1½"		20.7		16.3
50	2"		23.4		19.0
80	3"		30.9		26.5
100	4"		35.3		30.9
150	6"		56.2		51.8
200	8"		99.2		94.8
250	10"		165.4		161.0
300	12"		242.6		238.1
350	14"		385.9		381.5
400	16"		452.0		447.6
450	18"		562.3		557.9
500	20"		628.4		624.0
600	24"		893.0		888.6
700	28"	Class D	882.0	Class D	877.6
–	30"		1014.3		1009.9
800	32"		1212.8		1208.3
900	36"		1764.0		1759.6
1000	40"		1984.5		1980.1
–	42"		2425.5		2421.1
1200	48"		3087.0		3082.6
–	54"		4851.0		4846.6
–	60"		5953.5		5949.1
–	66"		8158.5		8154.1
1800	72"		9040.5		9036.1
–	78"		10143.0		10138.6

13.2

- Transmitter (compact version): 7.5 lbs
- Weight data valid for standard pressure ratings and without packaging material.

Measuring tube specifications

Diameter		Pressure rating						Internal diameter			
		EN (DIN)	AS 2129	AS 4087	ANSI	AWWA	JIS	Hard rubber		Polyurethane	
[mm]	[inch]	[bar]			[lbs]			[mm]	[inch]	[mm]	[inch]
25	1"	PN 40	–	–	Cl. 150	–	20 K	–	–	24	0.94
32	–	PN 40	–	–	–	–	20 K	–	–	32	1.26
40	1½"	PN 40	–	–	Cl. 150	–	20 K	–	–	38	1.50
50	2"	PN 40	Table E	PN 16	Cl. 150	–	10 K	50	1.97	50	1.97
65	–	PN 16	–	–	–	–	10 K	66	2.60	66	2.60
80	3"	PN 16	Table E	PN 16	Cl. 150	–	10 K	79	3.11	79	3.11
100	4"	PN 16	Table E	PN 16	Cl. 150	–	10 K	102	4.02	102	4.02
125	–	PN 16	–	–	–	–	10 K	127	5.00	127	5.00
150	6"	PN 16	Table E	PN 16	Cl. 150	–	10 K	156	6.14	156	6.14
200	8"	PN 10	Table E	PN 16	Cl. 150	–	10 K	204	8.03	204	8.03
250	10"	PN 10	Table E	PN 16	Cl. 150	–	10 K	258	10.2	258	10.2
300	12"	PN 10	Table E	PN 16	Cl. 150	–	10 K	309	12.2	309	12.2
350	14"	PN 6	Table E	PN 16	Cl. 150	–	–	342	13.5	342	13.5
375	15"	–	–	PN 16	–	–	–	392	15.4	–	–
400	16"	PN 6	Table E	PN 16	Cl. 150	–	–	392	15.4	392	15.4
450	18"	PN 6	–	–	Cl. 150	–	–	437	17.2	437	17.2
500	20"	PN 6	Table E	PN 16	Cl. 150	–	–	492	19.4	492	19.4
600	24"	PN 6	Table E	PN 16	Cl. 150	–	–	594	23.4	594	23.4
700	28"	PN 6	–	–	–	Class D	–	692	27.2	692	27.2
–	30"	–	–	–	–	Class D	–	742	29.2	742	29.2
800	32"	PN 6	–	–	–	Class D	–	794	31.3	794	31.3
900	36"	PN 6	–	–	–	Class D	–	891	35.1	891	35.1
1000	40"	PN 6	–	–	–	Class D	–	994	39.1	994	39.1
–	42"	–	–	–	–	Class D	–	1043	41.1	1043	41.1
1200	48"	PN 6	–	–	–	Class D	–	1197	47.1	1197	47.1
–	54"	–	–	–	–	Class D	–	1339	52.7	–	–
1400	–	PN 6	–	–	–	–	–	1402	55.2	–	–
–	60"	–	–	–	–	Class D	–	1492	58.7	–	–
1600	–	PN 6	–	–	–	–	–	1600	63.0	–	–
–	66"	–	–	–	–	Class D	–	1638	64.5	–	–
1800	72"	PN 6	–	–	–	Class D	–	1786	70.3	–	–
2000	78"	PN 6	–	–	–	Class D	–	1989	78.3	–	–

Material

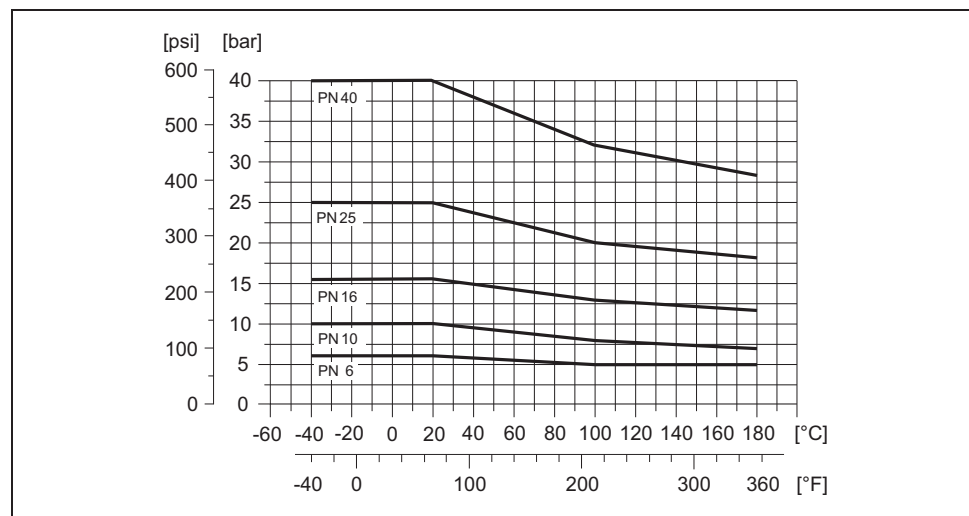
- Transmitter housing
 - Compact housing: powder-coated die-cast aluminum
 - Wall-mount housing: powder-coated die-cast aluminum
- Sensor housing
 - DN 25 to 300 (1 to 12"): powder-coated die-cast aluminum
 - DN 350 to 2000 (14 to 78"): with protective lacquering
- Measuring tube
 - DN ≤ 300 (12"): stainless steel 1.4301 or 1.4306/304L;
(for flanges made of carbon steel with Al/Zn protective coating)
 - DN ≥ 350 (14"): stainless steel 1.4301 or 1.4306/304L;
(for flanges made of carbon steel with Al/Zn protective coating)
- Electrodes: 1.4435, Alloy C-22, Tantalum
- Flanges
 - EN 1092-1 (DIN 2501): 1.4571/316L; RSt37-2 (S235JRG2); C22; FE 410W B
(DN ≤ 300 (12"): with Al/Zn protective coating; DN ≥ 350 (14") with protective lacquering)
 - ANSI: A105; F316L
(DN ≤ 300 (12"): with Al/Zn protective coating; DN ≥ 350 (14") with protective lacquering)
 - AWWA: 1.0425
 - JIS: RSt37-2 (S235JRG2); HII; 1.0425/316L
(DN ≤ 300 (12"): with Al/Zn protective coating; DN ≥ 350 (14") with protective lacquering)
 - AS 2129
 - DN 150 to 300, 600 (6 to 12", 24"): A105 or RSt37-2 (S235JRG2)
 - DN 50, 80, 100, 350, 400, 500 (2", 3", 4", 14", 16", 20"): A105 or St44-2 (S275JR)
 - AS 4087: A105 or St44-2 (S275JR)
- Seals: to DIN EN 1514-1
- Ground disks: 1.4435/316L, Alloy C-22, Tantalum

Material load diagram**Caution!**

The following diagrams contain material load diagrams (reference curves) for flange materials with regard to the medium temperature. However, the maximum medium temperatures permitted always depend on the lining material of the sensor and/or the sealing material (→ 21).

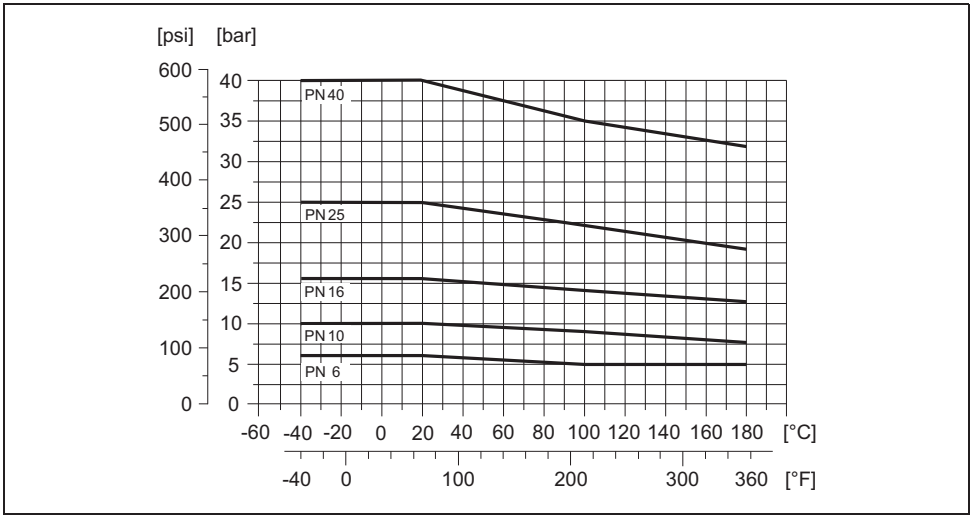
Flange connection to EN 1092-1 (DIN 2501)

Material: RSt37-2 (S235JRG2) / C22 / Fe 410W B



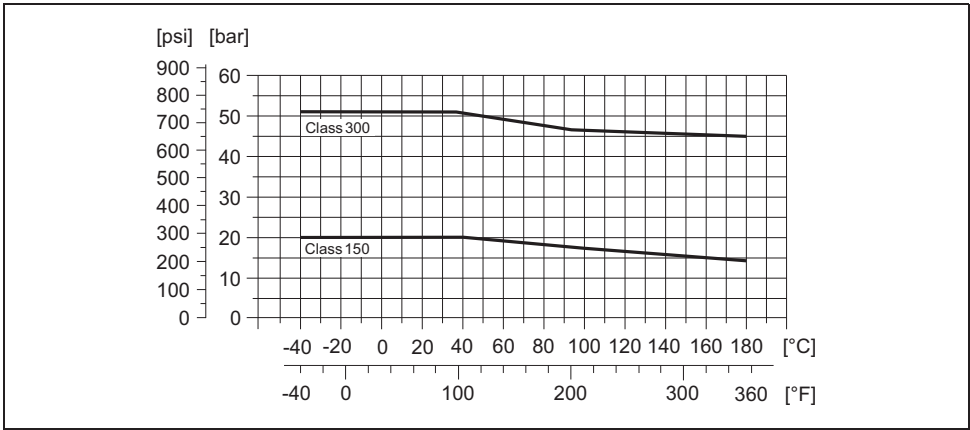
A0005594

Flange connection to EN 1092-1 (DIN 2501)
Material: 316L / 1.4571



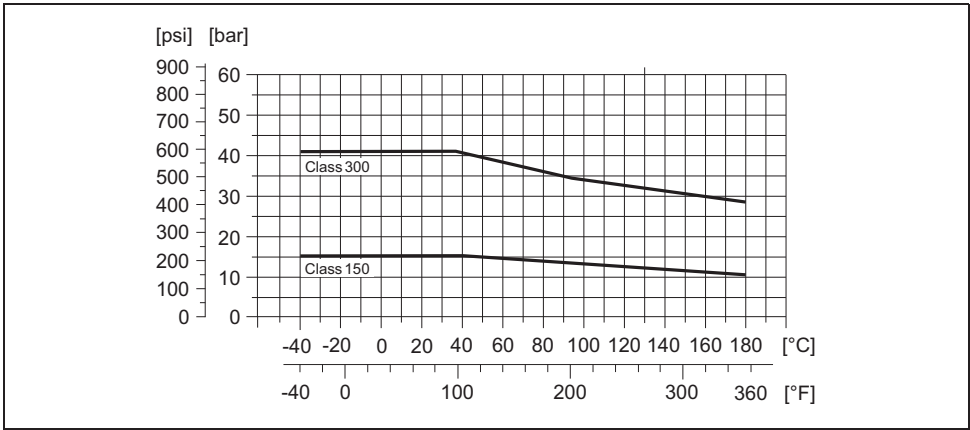
A0005304

Flange connection to ANSI B16.5
Material: A 105



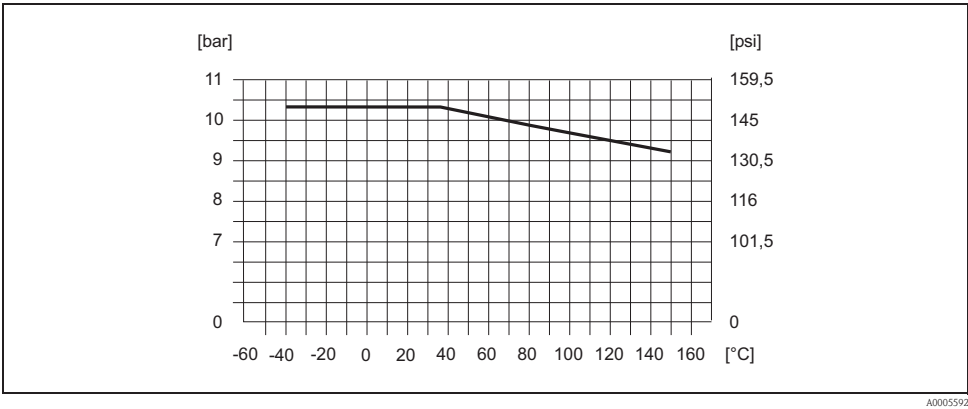
A0003226

Flange connection to ANSI B16.5
Material: F316L

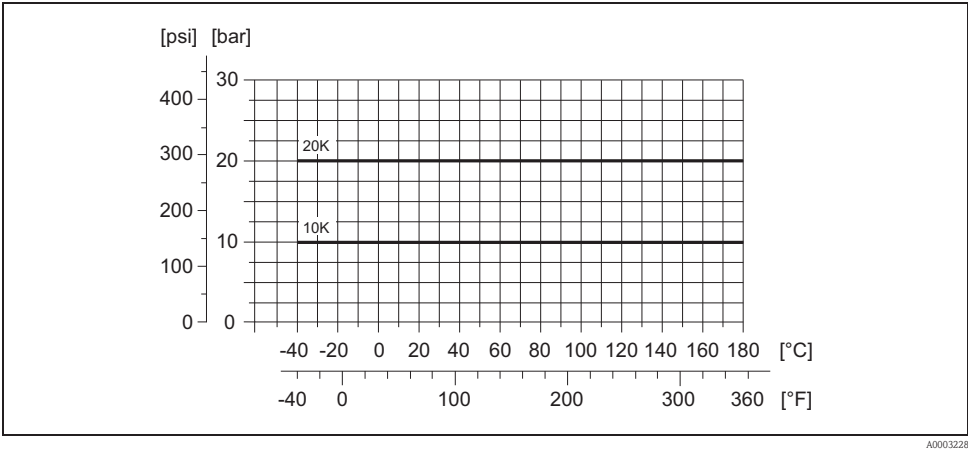


A0005307

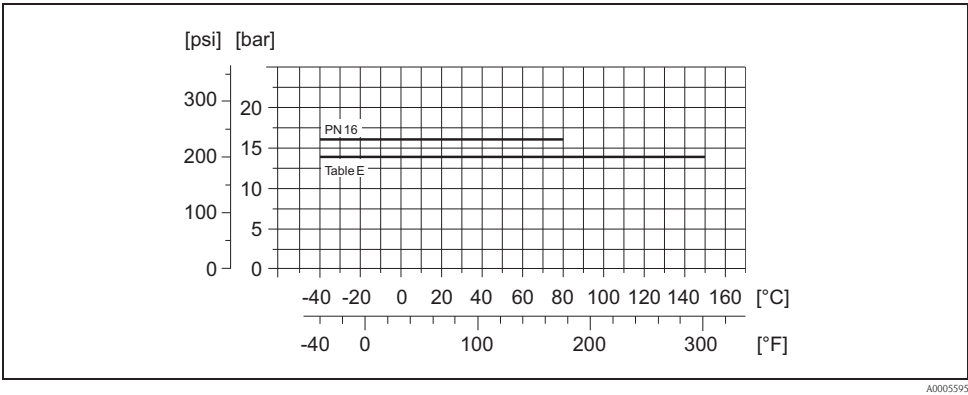
Flange connection to AWWA C 207, Class D
Material: 1.0425



Flange connection to JIS B2220
Material: RSt37-2 (S235JRG2) / HII / 1.0425 / 316L



Flange connection to AS 2129 Table E or AS 4087 PN 16
Material: A105 / RSt37-2 (S235JRG2) / St44-2 (S275JR)



Fitted electrodes	Measuring electrodes, reference electrodes and empty pipe detection electrodes: ■ Standard available with 1.4435, Alloy C-22, tantalum ■ Optional: exchangeable measuring electrodes made of 1.4435 (DN 350 to 2000 / 14 to 78")
Process connections	Flange connection: ■ EN 1092-1 (DIN 2501), DN ≤ 300 (12") form A, DN ≥ 350 (14") form B (Dimensions to DIN 2501, DN 65 PN 16 and DN 600 (24") PN 16 exclusively to EN 1092-1) ■ ANSI B16.5 ■ AWWA C 207, Class D ■ JIS B2220 ■ AS 2129 Table E ■ AS 4087 PN 16
Surface roughness	■ Electrodes – 1.4435, Alloy C-22, tantal: ≤ 0.3 to 0.5 µm (≤ 11.8 to 19.7 µin) (all data refer to parts in contact with medium)

Human interface

Display elements	■ Liquid crystal display: backlit, two lines (Promag 50) or four lines (Promag 53) with 16 characters per line ■ Custom configurations for presenting different measured-value and status variables ■ Totalizer – Promag 50: 2 totalizers – Promag 53: 3 totalizers
Operating elements	Unified operation concept for both types of transmitter: Promag 50: ■ Local operation via three keys (◀, +, E) ■ Quick Setup menus for straightforward commissioning Promag 53: ■ Local operation via three keys (◀, +, E) ■ Application-specific Quick Setup menus for straightforward commissioning
Language groups	Language groups available for operation in different countries: Promag 50, Promag 53: ■ Western Europe and America (WEA): English, German, Spanish, Italian, French, Dutch, Portuguese ■ Eastern Europe and Scandinavia (EES): English, Russian, Polish, Norwegian, Finnish, Swedish, Czech ■ South and east Asia (SEA): English, Japanese, Indonesian Promag 53: ■ China (CN): English, Chinese You can change the language group via the operating program "FieldCare".
Remote operation	■ Promag 50: Remote control via HART, PROFIBUS DP/PA ■ Promag 53: Remote control via HART, PROFIBUS DP/PA, MODBUS RS485, FOUNDATION Fieldbus

Certificates and approvals

CE mark	The measuring system is in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.
C-tick mark	The measuring system meets the EMC requirements of the "Australian Communications and Media Authority (ACMA)".
Pressure measuring device approval	Measuring devices with a nominal diameter smaller than or equal to DN 25 correspond to Article 3(3) of the EC Directive 97/23/EC (Pressure Equipment Directive) and have been designed and manufactured according to good engineering practice. Where necessary (depending on the medium and process pressure), there are additional optional approvals to Category II/III for larger nominal diameters.
Ex approval	Information about currently available Ex versions (ATEX, IECEx, FM, CSA, NEPSI) can be supplied by your Endress+Hauser Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.
Other standards and guidelines	■ EN 60529 Degrees of protection by housing (IP code) ■ EN 61010 Protection Measures for Electrical Equipment for Measurement, Control, Regulation and Laboratory Procedures. ■ IEC/EN 61326 "Emission in accordance with requirements for Class A". Electromagnetic compatibility (EMC requirements) ■ NAMUR NE 21: Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment. ■ NAMUR NE 43: Standardization of the signal level for the breakdown information of digital transmitters with analog output signal. ■ NAMUR NE 53: Software of field devices and signal-processing devices with digital electronics. ■ ANSI/ISA-S82.01 Safety Standard for Electrical and Electronic Test, Measuring, Controlling and related Equipment - General Requirements Pollution degree 2, Installation Category II. ■ CAN/CSA-C22.2 No. 1010.1-92 Safety requirements for Electrical Equipment for Measurement and Control and Laboratory Use. Pollution degree 2, Installation Category II
FOUNDATION Fieldbus certification	The flow device has successfully passed all the test procedures carried out and is certified and registered by the Fieldbus Foundation. The device thus meets all the requirements of the following specifications: ■ Certified to FOUNDATION Fieldbus Specification ■ The device meets all the specifications of the FOUNDATION Fieldbus H1. ■ Interoperability Test Kit (ITK), revision status 5.01 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers ■ Physical Layer Conformance Test of the Fieldbus Foundation
MODBUS RS485 certification	The measuring device meets all the requirements of the MODBUS/TCP conformity test and has the "MODBUS/TCP Conformance Test Policy, Version 2.0". The measuring device has successfully passed all the test procedures carried out and is certified by the "MODBUS/TCP Conformance Test Laboratory" of the University of Michigan.
PROFIBUS DP/PA certification	The flow device has successfully passed all the test procedures carried out and is certified and registered by the PNO (PROFIBUS User Organisation). The device thus meets all the requirements of the following specifications: ■ Certified to PROFIBUS PA, profile version 3.0 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers (interoperability)

Accessories

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter and the sensor. Your Endress+Hauser service organization can provide detailed information on the order codes in question.

Documentation

- Flow Measurement (FA005D/06)
- Operating Instructions Promag Promag 50 (BA046D/06 and BA049D/06)
- Operating Instructions Promag Promag 50 PROFIBUS PA (BA055D/06 and BA056D/06)
- Operating Instructions Promag Promag 53 (BA047D/06 and BA048D/06)
- Operating Instructions Promag Promag 53 FOUNDATION Fieldbus (BA051D/06 and BA052D/06)
- Operating Instructions Promag Promag 53 MODBUS RS485 (BA 117D/06 and BA 118D/06)
- Operating Instructions Promag Promag 53 PROFIBUS DP/PA (BA053D/06 and BA054D/06)
- Supplementary documentation on Ex-ratings: ATEX, IECEx, FM, CSA, NEPSI

Registered trademarks

HART®

Registered trademark of the HART Communication Foundation, Austin, USA

PROFIBUS®

Registered trademark of the PROFIBUS Nutzerorganisation e.V., Karlsruhe, D

FOUNDATION™ Fieldbus

Registered trademark of the Fieldbus Foundation, Austin, USA

MODBUS®

Registered trademark of the MODBUS Organisation

HistoROM™, S-DAT®, T-DAT™, F-CHIP®, FieldCare®, Fieldcheck®, FieldXpert™, Applicator®

Registered or registration-pending trademarks of Endress+Hauser Flowtec AG, Reinach, CH

Order Codes

NOTE: Endress+Hauser reserves the right to change or modify product, specifications, and ordering information at any time without notice.
Please consult Endress+Hauser or your local representative for the most recent information.

Please note that the Promag 50W/53W is also available with:

Hard rubber and Polyurethane liners; ACS, KTW/W270 and WRAS B59620 approvals
PED Cat. II / III material certificates
ATEX and NEPSI hazardous area approvals
DIN2501 and JIS B2220 process connections

Consult factory for information.

Promag 50W, 1" to 24"

Promag 50W -

Nominal Diameter

- 25 1"
- 40 1-1/2"
- 50 2"
- 80 3"
- 1H 4"
- 1F 6"
- 2H 8"
- 2F 10"
- 3H 12"
- 3F 14"
- 4H 16"
- 4F 18"
- 5H 20"
- 6H 24"
- 010 Liner
 - D Hard rubber, NSF61 drinking water approval (not available for 1", 1-1/2" or 2" sensors)
 - H Hard rubber (not available for 1", 1-1/2" or 2" sensors)
 - P Polyurethane, NSF61 drinking water approval
 - S Hard rubber HR (not available for 1", 1-1/2" or 2" sensors)
 - U Polyurethane
 - 9 Special version, to be specified
- 020 Process connection
 - L Class 150 ANSI B16.5 CS steel A105 flanges
 - M Class 300 ANSI B16.5 CS steel A105 flanges (not for 8" and larger)
 - R Class 150 ANSI B16.5 316L SS flanges
 - S Class 300 ANSI B16.5 316L SS flanges (not for 8" and larger)
 - 9 Special version, to be specified
- 030 Electrodes / material
 - 0 Measuring, reference and EPD electrodes / 316L SS
 - 1 Measuring, reference and EPD electrodes / Alloy C22
 - 2 Measuring, reference and EPD electrodes / tantalum
 - 7 Measuring electrode, exchangeable / 316L SS (for hard rubber liner only, 14" and larger sensors, no EPD or reference electrodes, for safe areas only)
 - G Measuring, reference and EPD electrodes, bullet nose / 316L SS
 - H Measuring, reference and EPD electrodes, bullet nose / Alloy C-22
 - 9 Special version, to be specified
- 040 Calibration
 - A 3-point calibration, 0.5%
 - B 3-point calibration, 0.2%
 - D SCS/A2LA 3-point 0.5% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
 - E SCS/A2LA 3-point 0.2% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
 - 9 Special version, to be specified
- 050 Certificates
 - 1 Standard, no certificate
 - 2 3.1B material certificate for pipe and flanges
 - 3 2.3 pressure test certificate (1.5 x PN, 3 minutes) for sensors up to 12" only
 - 4 3.1B material and 2.3 pressure test certificate for sensors up to 12" only
 - 5 CRN approval
 - 8 CRN approval + material certificate + pressure test
 - 9 Special version, to be specified
- 060 Approvals
 - A For use in non-hazardous areas
 - N FM explosion proof Class I, Div. 1 / CSA Class I, Div. 1 (only for aluminum field housing, compact version, not for 14" and larger sensors)
 - R FM non-incendive Class I, Div. 2 / CSA Class I, Div. 2

- 070 Housing
 - A NEMA 4X (IP 67) compact aluminum housing
 - C NEMA 4X (IP 67) remote wall-mounted (only for approvals A or R)
 - G NEMA 4X (IP 67) remote aluminum field housing for non-hazardous areas
 - K NEMA 6P sensor, wall-mounted housing (only for approvals A or R)
 - N NEMA 6P sensor, aluminum field housing, non-hazardous
 - P NEMA 4X (IP 67) compact aluminum housing, HE (harsh environment), compact and remote sensor sizes up to 12" only *
 - S NEMA 4X (IP 67) remote wall-mounted housing, HE (harsh environment), remote sensor sizes 14" to 78" (only for approvals A and R) *
 - 1 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact, aluminum field housing (only for approvals A and R)
 - 3 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact (only for approvals A and R)
 - 5 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67) wall mount housing, for NEMA 6P sensor (only for approvals A and R)
 - 9 Special version, to be specified
- 080 Cable for remote
 - 0 Without cable
 - 1 15 foot coil and signal cable
 - 2 30 foot coil and signal cable
 - 5 Coil and signal cable, specify length (maximum 650 ft depending on conductivity of process material)
 - 7 Coil and signal cable, flexible conduit, specify length (maximum 650 ft depending on conductivity of process material)
 - 9 Special version, to be specified
- 090 Cable entries
 - B 1/2" NPT
 - L 1/2" NPT fieldbus connector (only for approval A and R)
 - 9 Special version, to be specified
- 100 Power supply / display
 - 7 85 to 260 VAC, without display, remote configuration only (not for wall mount or SS housing)
 - 8 20 to 55 VAC / 16 to 62 VDC, without display, remote configuration only (not for wall mount or SS housing)
 - A 85 to 260 VAC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
 - B 20 to 55 VAC / 16 to 62 VDC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
 - X Sensor only (without transmitter, only available up to 8")
 - 9 Special version, to be specified
- 110 Software
 - A Standard software
 - X Sensor only (up to 8" only)
 - 9 Special version, to be specified
- 120 Outputs / Inputs
 - A Current HART, SIL, frequency
 - D Current HART, SIL, frequency, status output, status input
 - H PROFIBUS-PA (approvals A and R only)
 - J PROFIBUS-DP (approvals A and R only)
 - S Current HART, SIL, frequency; active I.S. (not for approvals A and R)
 - T Current HART, SIL, frequency; passive I.S. (not for approvals A and R)
 - W Current HART, SIL
 - X Sensor only
 - 9 Special version, to be specified

* Harsh environment (HE) option is available for process conditions where cool process temperatures in tropical (high humidity) environments or process fluids which undergo large cyclical temperature variations which can cause high amounts of moisture that could condense onto the measurement tube.

Promag 50W, 28" to 78"

Promag 50W -

Nominal Diameter

7H 28"
7F 30", AWWA
8H 32"
9H 36"
TO 40"
VO 42", AWWA
T2 48"
V3 54", AWWA
V5 60", AWWA
V6 66", AWWA
T8 72"
V9 78", AWWA

010 Liner

D Hard rubber, NSF61 drinking water approval
H Hard rubber
P Polyurethane, NSF61 drinking water approval (not available for 42" up to 78")
S Hard rubber HR
U Polyurethane (not available for 42" up to 78")
9 Special version, to be specified

020 Process connection

P Class D AWWA carbon steel A105 flanges
9 Special version, to be specified

030 Electrodes / material

0 Measuring, reference and EPD electrodes / 316L SS
1 Measuring, reference and EPD electrodes / Alloy C22
2 Measuring, reference and EPD electrodes / tantalum
7 Measuring electrode, exchangeable / 316L SS (for hard rubber liner only, 14" and larger sensors, no EPD or reference electrodes, for safe areas only)
G Measuring, reference and EPD electrodes, bullet nose / 316L SS
H Measuring, reference and EPD electrodes, bullet nose / Alloy C-22
9 Special version, to be specified

040 Calibration

A 3-point calibration, 0.5%
B 3-point calibration, 0.2%
D SCS/A2LA 3-point 0.5% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
E SCS/A2LA 3-point 0.2% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
9 Special version, to be specified

050 Certificates

1 Standard, no certificate
2 3.1B material certificate for pipe and flanges
9 Special version, to be specified

060 Approvals

A For use in non-hazardous areas
R FM non-incendive Class I, Div. 2 / CSA Class I, Div. 2

070 Housing

A NEMA 4X (IP 67) compact aluminum housing
C NEMA 4X (IP 67) remote wall-mounted (only for approvals A or R)
G NEMA 4X (IP 67) remote aluminum field housing for non-hazardous areas
K NEMA 6P sensor, wall-mounted housing (only for approvals A or R)
S NEMA 4X (IP 67) remote wall-mounted housing, HE (harsh environment), remote sensor sizes 14" to 78" (only for approvals A and R) *
1 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact, aluminum field housing (only for approvals A and R)
3 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact (only for approvals A and R)
5 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67) wall mount housing, for NEMA 6P sensor (only for approvals A and R)
9 Special version, to be specified

080 Cable for remote

0 Without cable
1 15 foot coil and signal cable
2 30 foot coil and signal cable
5 Coil and signal cable, specify length (maximum 650 ft depending on conductivity of process material)
7 Coil and signal cable, flexible conduit, specify length (maximum 650 ft depending on conductivity of process material)
9 Special version, to be specified

090 Cable entries

B 1/2" NPT
L 1/2" NPT fieldbus connector (only for approval A and R)
9 Special version, to be specified

100 Power supply / display

7 85 to 260 VAC, without display, remote configuration only (not for wall mount or SS housing)
8 20 to 55 VAC / 16 to 62 VDC, without display, remote configuration only (not for wall mount or SS housing)
A 85 to 260 VAC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
B 20 to 55 VAC / 16 to 62 VDC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
X Sensor only (without transmitter, only available up to 8")
9 Special version, to be specified

110 Software

A Standard software
9 Special version, to be specified

120 Outputs / Inputs

A Current HART, SIL, frequency
D Current HART, SIL, frequency, status output, status input
H PROFIBUS-PA (approvals A and R only)
J PROFIBUS-DP (approvals A and R only)
S Current HART, SIL, frequency; active I.S. (not for approvals A and R)
T Current HART, SIL, frequency; passive I.S. (not for approvals A and R)
W Current HART, SIL
X Sensor only
9 Special version, to be specified

* Harsh environment (HE) option is available for process conditions where cool process temperatures in tropical (high humidity) environments or process fluids which undergo large cyclical temperature variations which can cause high amounts of moisture that could condense onto the measurement tube.

Promag 53W, 1" to 24"

Promag 53W -

Nominal Diameter

25 1"
40 1-1/2"
50 2"
80 3"
1H 4"
1F 6"
2H 8"
2F 10"
3H 12"
3F 14"
4H 16"
4F 18"
5H 20"
6H 24"

010 Liner

D Hard rubber, NFS61 drinking water approval (not available for 1", 1-1/2" or 2" sensors)
H Hard rubber (not available for 1", 1-1/2" or 2" sensors)
P Polyurethane, NSF61 drinking water approval
S Hard rubber HR (not available for 1", 1-1/2" or 2" sensors)
U Polyurethane
9 Special version, to be specified

020 Process connection

L Class 150 ANSI B16.5 CS steel A105 flanges
M Class 300 ANSI B16.5 CS steel A105 flanges (not for 8" and larger)
R Class 150 ANSI B16.5 316L SS flanges
S Class 300 ANSI B16.5 316L SS flanges (not for 8" and larger)
9 Special version, to be specified

030 Electrodes / material

0 Measuring, reference and EPD electrodes / 316L SS
1 Measuring, reference and EPD electrodes / Alloy C22
2 Measuring, reference and EPD electrodes / tantalum
7 Measuring electrode, exchangeable / 316L SS (for hard rubber liner only, 14" and larger sensors, no EPD or reference electrodes, for safe areas only)
G Measuring, reference and EPD electrodes, bullet nose / 316L SS
H Measuring, reference and EPD electrodes, bullet nose / Alloy C-22
9 Special version, to be specified

040 Calibration

B 3-point calibration, 0.2%
E SCS/A2LA 3-point, 0.2% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
9 Special version, to be specified

050 Certificates

1 Standard, no certificate
2 3.1B material certificate for pipe and flanges
3 2.3 pressure test certificate (1.5 x PN, 3 minutes) for sensors up to 12" only
4 3.1B material and 2.3 pressure test certificate for sensors up to 12" only
5 CRN approval
8 CRN approval + material certificate + pressure test
9 Special version, to be specified

060 Approvals

A For use in non-hazardous areas
N FM explosion proof Class I, Div. 1 / CSA Class I, Div. 1 (only for aluminum field housing, compact version, not for 14" and larger sensors)
R FM non-incendive Class I, Div. 2 / CSA Class I, Div. 2

070 Housing

A NEMA 4X (IP 67) compact aluminum housing
C NEMA 4X (IP 67) remote wall-mounted (only for approvals A or R)
G NEMA 4X (IP 67) remote aluminum field housing for non-hazardous areas
K NEMA 6P sensor, wall-mounted housing (only for approvals A or R)
N NEMA 6P sensor, aluminum field housing, non-hazardous
P NEMA 4X (IP 67) compact aluminum housing, HE (harsh environment), compact and remote sensor sizes up to 12" only *
S NEMA 4X (IP 67) remote wall-mounted housing, HE (harsh environment), remote sensor sizes 14" to 78" (only for approvals A and R) *
1 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact, aluminum field housing (only for approvals A and R)
3 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact (only for approvals A and R)
5 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67) wall mount housing, for NEMA 6P sensor (only for approvals A and R)
9 Special version, to be specified

080 Cable for remote

0 Without cable
1 15 foot coil and signal cable
2 30 foot coil and signal cable
5 Coil and signal cable, specify length (maximum 650 ft depending on conductivity of process material)
7 Coil and signal cable, flexible conduit, specify length (maximum 650 ft depending on conductivity of process material)
9 Special version, to be specified

090 Cable entries

B 1/2" NPT
L 1/2" NPT Fieldbus connector (only for approval A and R)
9 Special version, to be specified

100 Power supply / display

7 85 to 260 VAC, without display, remote configuration only (not for wall mount or SS housing)
8 20 to 55 VAC / 16 to 62 VDC, without display, remote configuration only (not for wall mount or SS housing)
A 85 to 260 VAC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
B 20 to 55 VAC / 16 to 62 VDC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
X Sensor only (without transmitter, only available up to 8")
9 Special version, to be specified

110 Software

A Standard software
C ECC electrode cleaning circuit (only for approvals A and R)
9 Special version, to be specified

120 Outputs / Inputs

Fixed communication boards
A Current HART, SIL, frequency
B Current HART, SIL, frequency, 2 relays
F PROFIBUS-PA, IS
G Foundation Fieldbus, IS
H PROFIBUS-PA
J PROFIBUS-DP
K Foundation Fieldbus
Q Modbus RS485, status input
S Current HART, SIL, frequency; active I.S
T Current HART, SIL, frequency; passive I.S
Flexible communication boards
C Current HART, SIL, frequency, 2 relays, flexible module
D Current HART, SIL, frequency, relay, and status input, flexible module
L Current HART, SIL, 2 relays and status input/output
M Current HART, SIL, 2 frequency output, status input
N Modbus RS 485, current and frequency output, status input
P PROFIBUS-DP, current and frequency output, status input
V PROFIBUS-DP, two relay outputs, status input
2 Current HART, SIL, relay, current, frequency outputs
4 Current HART, SIL, relay, frequency outputs, current input
7 Modbus RS485, two relay outputs, status input
X Sensor only
9 Special version, to be specified

* Harsh environment (HE) option is available for process conditions where cool process temperatures in tropical (high humidity) environments or process fluids which undergo large cyclical temperature variations which can cause high amounts of moisture that could condense onto the measurement tube.

Promag 53W, 28" to 78"

Promag 53W -

Nominal Diameter

- | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|
| 7H | 28" | 010 | | 020 | | 030 | | 040 | | 050 | | 060 | | 070 | | 080 | | 090 | | 100 | | 110 | | 120 | |
|----|-----|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|
- 010 Liner
- D Hard rubber, NSF61 drinking water approval
 - H Hard rubber
 - P Polyurethane, NSF61 drinking water approval (not available for 42" to 78" sensors)
 - S Hard rubber HR
 - U Polyurethane (not available for 42" to 78" sensors)
 - 9 Special version, to be specified
- 020 Process connection
- P Class D AWWA carbon steel A105 flanges
 - 9 Special version, to be specified
- 030 Electrodes / material
- 0 Measuring, reference and EPD electrodes / 316L SS
 - 1 Measuring, reference and EPD electrodes / Alloy C22
 - 2 Measuring, reference and EPD electrodes / tantalum
 - 7 Measuring electrode, exchangeable / 316L SS (for hard rubber liner only, 14" and larger sensors, no EPD or reference electrodes, for safe areas only)
 - G Measuring, reference and EPD electrodes, bullet nose / 316L SS
 - H Measuring, reference and EPD electrodes, bullet nose / Alloy C-22
 - 9 Special version, to be specified
- 040 Calibration
- B 3-point calibration, 0.2%
 - E SCS/A2LA 3-point 0.2% calibration (ISO/IEC 17025) with certificate traceable according to ISO 9000 (specify range)
 - 9 Special version, to be specified
- 050 Certificates
- 1 Standard, no certificate
 - 2 3.1B material certificate for pipe and flanges
 - 9 Special version, to be specified
- 060 Approvals
- A For use in non-hazardous areas
 - R FM non-incendive Class I, Div. 2 / CSA Class I, Div. 2
- 070 Housing
- A NEMA 4X (IP 67) compact aluminum housing
 - C NEMA 4X (IP 67) remote wall-mounted (only for approvals A or R)
 - G NEMA 4X (IP 67) remote aluminum field housing for non-hazardous areas
 - K NEMA 6P sensor, wall-mounted housing (only for approvals A or R)
 - S NEMA 4X (IP 67) remote wall-mounted housing, HE (harsh environment), remote sensor sizes 14" to 78" (only for approvals A and R) *
 - 1 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact, aluminum field housing (only for approvals A and R)
 - 3 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67), compact (only for approvals A and R)
 - 5 -40°F (-40°C) ambient temperature, NEMA 4X (IP 67) wall mounting housing, for NEMA 6P sensor (only for approvals A and R)
 - 9 Special version, to be specified
- 080 Cable for remote
- 0 Without cable
 - 1 15 foot coil and signal cable
 - 2 30 foot coil and signal cable
 - 5 Coil and signal cable, specify length (maximum 650 ft depending on conductivity of process material)
 - 7 Coil and signal cable, flexible conduit, specify length (maximum 650 ft depending on conductivity of process material)
 - 9 Special version, to be specified
- 090 Cable entries
- B 1/2" NPT
 - L 1/2" NPT Fieldbus connector (only for approval A and R)
 - 9 Special version, to be specified
- 100 Power supply / display
- 7 85 to 260 VAC, without display, remote configuration only (not for wall mount or SS housing)
 - 8 20 to 55 VAC / 16 to 62 VDC, without display, remote configuration only (not for wall mount or SS housing)
 - A 85 to 260 VAC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
 - B 20 to 55 VAC / 16 to 62 VDC, with display, push button operation (language: EN, ES, FR, IT, NL, PT, DE)
 - 9 Special version, to be specified
- 110 Software
- A Standard software
 - C ECC electrode cleaning circuit (only for approvals A and R)
 - 9 Special version, to be specified
- 120 Outputs / Inputs
- Fixed communication boards
- A Current HART, SIL, frequency
 - B Current HART, SIL, frequency, 2 relays
 - F PROFIBUS-PA, IS
 - G Foundation Fieldbus, IS
 - H PROFIBUS-PA
 - J PROFIBUS-DP
 - K Foundation Fieldbus
 - Q Modbus RS485, status input
 - S Current HART, SIL, frequency; active I.S
 - T Current HART, SIL, frequency; passive I.S
- Flexible communication boards
- C Current HART, SIL, frequency, 2 relays, flexible module
 - D Current HART, SIL, frequency, relay, and status input, flexible module
 - L Current HART, SIL, 2 relays and status input/output
 - M Current HART, SIL, 2 frequency output, status input
 - N Modbus RS 485, current and frequency output, status input
 - P PROFIBUS-DP, current and frequency output, status input
 - V PROFIBUS-DP, two relay outputs, status input
 - 2 Current HART, SIL, relay, current, frequency outputs
 - 4 Current HART, SIL, relay, frequency outputs, current input
 - 7 Modbus RS485, two relay outputs, status input
 - X Sensor only
 - 9 Special version, to be specified

* Harsh environment (HE) option is available for process conditions where cool process temperatures in tropical (high humidity) environments or process fluids which undergo large cyclical temperature variations which can cause high amounts of moisture that could condense onto the measurement tube.

United States	Canada	Mexico	Instruments International
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T1046D/24/en/07.10
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CS-413-310 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
TECKNO VALVE	ST-413-359	PI4-011	4.5"	DIAPHRAGM PRESSURE GAUGE	PRESSURE GAUGE C/W ISOLATOR // MANUFACTURER : ASHCROFT // MODEL 45- 1009SL-04L-60#-XAJ C/W SEAL 50-101SS-04T-XCG	N/A	N/A	SLUDGE TANK		rev1

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Type 1009 4½" & 6" Stainless Steel Gauge



- 4½" and 6" SS gauges
- Dry and liquid-filled versions
- Micrometer adjustable pointer
- Variety of Bourdon tube materials
- ASME Grade 1A, ±1% of span accuracy
- New PLUS!™ Performance Option:
 - Liquid-filled performance in a dry gauge
 - Fights vibration and pulsations with out liquid-fill headaches
 - Order as option XLL

The 4½" and 6" Ashcroft® Type 1009 gauges are suitable where ambient corrosion is a major concern. Its attractive stainless steel case and ring provides excellent resistance to chemical, weather and corrosion attack. This 1009 has many optional features that allow a user to develop a basic or special product specification. The 1009 is part of the extensive line of Ashcroft stainless steel pressure gauges.

The gauge is available dry, liquid-filled weatherproof or hermetically sealed and now with **PLUS!™** Performance option.

TEMPERATURE LIMITS

	Ambient	Process	Storage
Dry	-20°F/200°F ⁽¹⁾ (-29°C/93°C)	-20°F/250°F ⁽¹⁾ (-29°C/121°C)	-40°F/250°F (-40°C/121°C)
PLUS!™	-40°F/150°F (-40°C/66°C)	-40°F/200°F (-40°C/93°C)	-40°F/150°F (-40°C/66°C)
LF (glycerin)	20°F/150°F (7°C/66°C)	20°F/150°F (7°C/93°C)	0°F/150°F (-18°C/66°C)
(silicone)	-40°F/150°F (-40°C/66°C)	-40°F/200°F (-40°C/93°C)	-40°F/150°F (-40°C/66°C)
(Halocarbon®)	-40°F/150°F (-40°C/66°C)	-40°F/200°F (-40°C/93°C)	-40°F/150°F (-40°C/66°C)

Note: Other than discoloration of the dial and hardening of the gasketing that may occur as ambient or process temperatures exceeds 150°F, non-liquid-filled gauges with standard glass windows, can withstand continuous operating temperatures up to 250°F (121°C). Liquid-filled gauges can withstand 200°F (93°C) but glycerin fill and acrylic window will tend to yellow. Accuracy at temperatures above or below the reference ambient temperature of 68°F will be affected by approximately .4% per 25°F. Gauges with welded joints will withstand 750°F (450°F (232°C) with silver brazed joints) for short times without rupture, although other parts of the gauge will be destroyed and calibration will be lost. For continuous use and for process or ambient temperatures above 250°F (121°C), a diaphragm seal or capillary or siphon is recommended.

PRODUCT SPECIFICATIONS

Model Number:	1009
Accuracy:	1% full scale (Grade A, ASME B40.100)
Ranges:	Vacuum – 30,000 psi
Dial Size:	4½" and 6" diameter
Case:	Open front
Case Material:	304 SS
Weather Protection:	Dry Case: IP54 Liquid filled or hermetically sealed case: IP 65
Ring Type:	304 SS, bayonet
Window:	Glass
Dial:	Aluminum, white background, black figures and graduations.
Pointer:	Micrometer adjustable
Movement:	400 SS (conventional)
Bourdon Tube and Socket:	Bronze/Brass (A) ⁽¹⁾ 316L SS/316L SS (S) ⁽²⁾ Monel®/Monel® (P) ⁽²⁾

Connection Size:	¼, ½ NPT
Connection Location:	Lower and back

PRODUCT OPTIONS

PLUS! Performance:	XLL
Fill:	L-Glycerin-Standard XGV-Silicone-Optional XGX-Halocarbon®-Optional

Weatherproof	
Hermetic Seal:	XLJ
Panel Mount	
Front Flange:	XFF
Panel Mount	
U-Clamp:	XUC
Surface Mount:	XBF
Oxygen Clean:	X6B
Window	
Acrylic:	XPD
Shatterproof	
Glass:	XSG

⁽¹⁾ Joints silver brazed
⁽²⁾ Joints welded

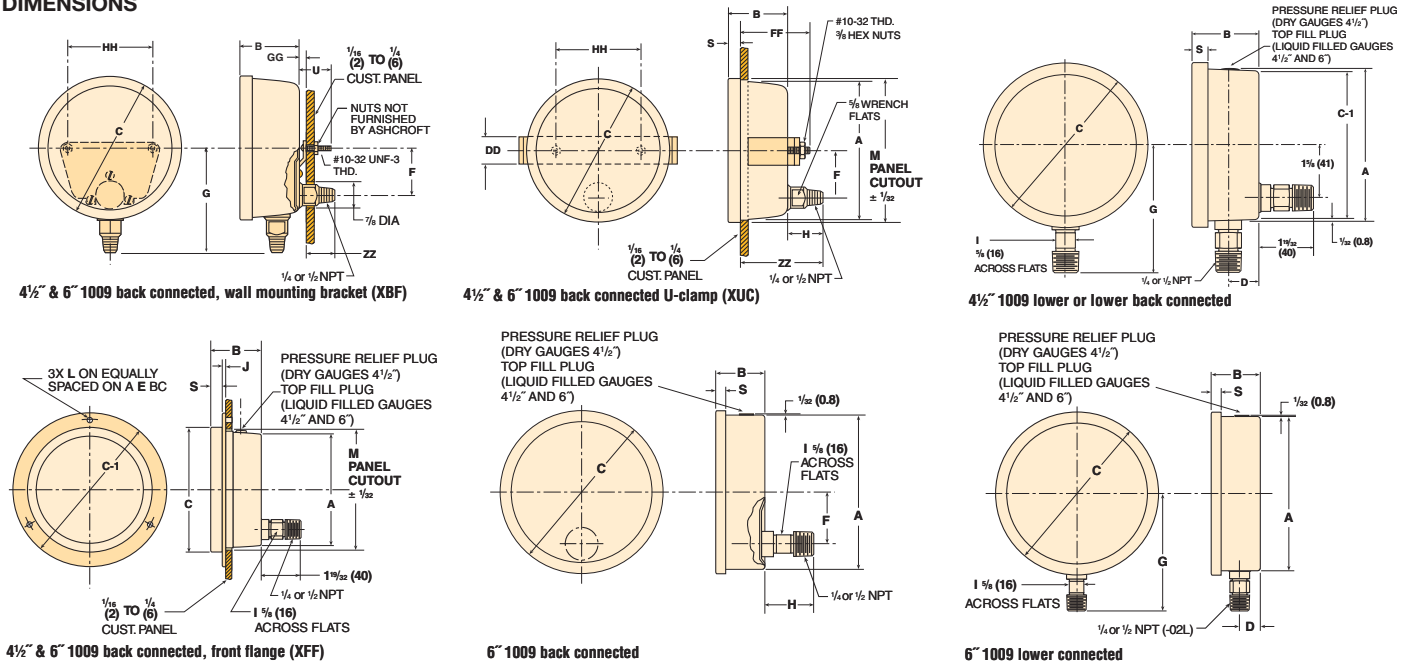
45/60 1009 GAUGE PRODUCT CODING

Typical Code:

45	1009	S		L	04	L	XSG		100#
SIZE	TYPE NUMBER	SYSTEM (Tube & Socket)		CASE DESIGN	PROCESS CONN. SIZE	CONNECTION LOCATION	VARIATIONS	RANGE	ENGINEERING UNITS ⁽¹⁾
(45) 4½" (60) 6"	1009	Code Bourdon Tube (A) Phos Brz ⁽¹⁾ (S) AISI 316SS ⁽²⁾ (P) K Monel ⁽²⁾	Socket Brass AISI 316SS Monel 400	Code Description (L) Liquid Filled (glycerin std.)	Code NPT (02) ¼ Male ⁽¹⁾ (04) ½ Male ⁽¹⁾ (09) ¾-18 UNF-2B Amino (standard for high pressure >20,000 psi (1) Max Pressure 20,000 psi	Code Description (L) Lower Back (B) Back (D) Side Conn. (E) Side Conn. (T) Top	(GV) Silicone Case Fill (GX) Halocarbon Case Fill (NH) SS Wired Tag (TS) Throttle Screw ⁽¹⁾ (GB) Oxygen Service (PD) Acrylic Window ⁽¹⁾ (SG) Safety Glass (LJ) Hermetically Sealed Liquid Filled (IP65) (EP) Maximum Pointer, Adjustable (SH) Red Set Hand, Stationary (LL) PLUS!™ Performance (FF) Flush Mounting Ring (C4) Individual Calibration Chart (1) Standard with hermetically sealed or liquid filled gauge.	15 30 60 100 160 200 300 400 600 1000 1500 2000 3000 5000 6000 10,000 20,000 30,000	(#) PSI (BR) Bar (KG) Kilograms/ CMP (KP) Kilopascal (IMV) Inches of Mercury Vacuum (1) See website for more units of measure

Type 1009 4½" & 6" Stainless Steel Gauge

DIMENSIONS



Gauge Size	A	B	C	C-1	D	DD	E	F	FF	G	GG	H	HH	I	J	L	M	S	U	ZZ	Weight	
																					Dry	LF
4½ (100)	4 ²³ / ₃₂ (120)	2 ¹ / ₁₆ (52)	5 ³ / ₃₂ (129)	6 ¹ / ₄ (159)	1 ⁵ / ₁₆ (24)	1 (25)	5 ¹¹ / ₁₆ (144)	1 ⁵ / ₈ (41)	2 ⁵ / ₁₆ (59)	3 ¹⁵ / ₁₆ (100)	3 ¹ / ₁₆ (5)	1 ⁵ / ₈ (41)	3 (76)	5 ⁵ / ₁₆ (16)	5 ¹ / ₃₂ (4)	7 ¹ / ₃₂ (6)	4 ¹³ / ₁₆ (122)	1 ⁵ / ₃₂ (12)	1 ⁷ / ₁₆ (37)	3 ⁹ / ₃₂ (83)	1.75#	2.40#
6 (160)	6 ⁵ / ₁₆ (160)	2 (51)	6 ²¹ / ₃₂ (169)	7 ⁴¹ / ₆₄ (194)	2 ⁷ / ₃₂ (22)	1 (25)	7 ¹ / ₃₂ (179)	1 ⁵ / ₈ (41)	2 ⁵ / ₈ (67)	4 ¹³ / ₁₆ (122)	3 ¹ / ₁₆ (5)	1 ⁵ / ₈ (41)	4½ (114)	5 ⁵ / ₁₆ (16)	1 ¹ / ₁₆ (2)	¼ (7)	6 ⁷ / ₁₆ (163)	1 ¹³ / ₃₂ (10)	1 ⁷ / ₁₆ (37)	3 ³ / ₁₆ (81)	2.25#	4.12#
																					1kg	1.85k

Note: Dimensions in brackets () are millimeters.

Standard Ranges (Metric equivalents available)

Pressure – psi				
Range	Figure Interval		Minor Graduation	
0/15	1		0.2	
0/30	5		0.5	
0/60	5		0.5	
0/100	10		1	
0/160	20		2	
0/200	20		2	
0/300	50		5	
0/400	50		5	
0/600	50		10	
0/800	100		10	
0/1000	100		10	
0/1500	200		20	
0/2000	200		20	
0/3000	500		20	
0/5000	500		50	
0/6000	500		50	
0/10,000	1000		100	
0/20,000	2000		250	
0/30,000	5000		200	
Compound				
Range	Figure Interval		Minor Grads	
	in Hg	psi	in Hg	psi
30" Hg/15 psi	5	3	0.5	0.2
30" Hg/30 psi	10	5	1	0.5
30" Hg/60 psi	10	10	1	1
30" Hg/100 psi	10	10	2	1
30" Hg/150 psi	10	20	5	2
30" Hg/200 psi	30	20	5	2
30" Hg/300 psi	30	50	5	2
Vacuum				
Range	Figure Interval		Minor Grads	
30/0 in. Hg	5 in		0.2 in	
34/0 ft H ₂ O	5 ft		0.5 ft	

Type 100 Series Threaded Capsule Diaphragm Seal



TYPE 100 SHOWN

When isolation of the process from an instrument is required, Ashcroft® offers a comprehensive line of diaphragm seals. Seal types include threaded, flanged, in-line threaded, in-line flanged, in-line socket weld, in-line butt weld, saddle and sanitary seals. Also available is a complete offering of isolation or iso-rings and isolation or iso-spools.

APPLICATIONS

- Elevated process temperatures
- Corrosive service
- Isolation of the process for safety
- Suspended solids in the process
- Sanitary connections
- Minimize process dead leg
- Ease of cleaning between batches

FEATURES

- The top housing and diaphragm capsule are interchangeable with all Ashcroft bottom housings.
- A fill/bleed connection is standard, which permits filling the seal and instrument simultaneously after evacuation and allows the fill to flow into the completed unit.
- A Viton O-ring, compatible with all standard fill fluids, and a Teflon back-up ring provide a seal between the diaphragm capsule and the top housing.
- A thin Teflon PTFE gasket between the diaphragm and bottom housing ensures a leak-tight corrosion resistant seal even at high pressure.
- Top housing and pressure instrument are removable.
- Continuous-duty design will prevent loss of process fluid if pressure instrument is removed or fails.

SPECIFICATIONS

Model Number: Type 100, 101, 102, 103, 104, 105, 106, 107, 108

Process Connection Size: See Table A (Pg. 2)

Instrument Connection Size: 1/4, 1/2 NPT

Diaphragm Material: See Table B (Pg. 2)

Bottom Housing Materials: See Table C (Pg. 2)

Filling Fluid: Glycerin, Halocarbon, Silicone, Stylytherm

OPTIONS

316 stainless steel top housing	Code YT
Stainless steel clamp rings and flanged ring – includes 300 stainless steel clamping bolts (1500 psi max)	SE
300 series stainless steel clamping bolts (max pres is 1500 psi)	SB
Pipe plugs for flushing connections – pipe plugs are available in the same materials as bottom housings per Table C (Pg. 2)	PU
5000 psi pressure rating Threaded inlet and metal diaphragm only	HP
Welded instrument to diaphragm seal	DU
Dual flushing connections (1/2 NPT) (Limited to 2" thru 3" flanged seals)	DB
Ring joint (Flanged seal only)	RJ
Flat face (Flanged seal only)	FF
Clean for gaseous oxygen or strong oxidizing agent applications	6B

Type 100 Series Threaded Capsule Diaphragm Seal

TYPE 100 SERIES THREADED CAPSULE SEAL TYPES

Type 100 – Threaded ¼, ½, ¾, 1 NPT



Type 101 – Threaded with flushing connection ¼, ½, ¾, 1 NPT



Type 102 – Raised Face Flanged ½, ¾, 1, 1½, 2, 3"



Type 103 – Raised Face Flanged ½, ¾, 1, 1½, 2, 3 with flushing connection



Type 104 – In-line Threaded ¼, ½, ¾, 1 NPT



Type 105 – Saddle 3, 4" pipe only



Type 106 – In-line Flanged ½, ¾, 1, 1½, 2, 3, 4, 6, 8"



Type 107 – In-line Socket Weld ½, ¾, 1, 1½, 2"



Type 108 – In-line Butt Weld ¼, ½, ¾, 1, 1½, 2"



Table A – Process Connection/Type Number

	Process Connection Size/Code—Inches											Type Number
	Size	¼	½	¾	1	1½	2	3	4	6	8	
Process Connection	Code	25	50	75	10	15	20	30	40	60	80	
Threaded—female NPT		•	•	•	•	•						100
Threaded—female NPT (with flushing conn.)		•	•	•	•	•						101
Flanged ⁽¹⁾			•	•	•	•	•	•				102
Flanged (with flushing conn.)			•	•	•	•	•	•				103
In-line—threaded NPT		•	•	•	•							104
Saddle								•	AND LARGER			105
In-line—butt weld		•	•	•	•	•	•					108
In-line—flanged ⁽²⁾			•	•	•	•	•	•	•	•	•	106
In-line—socket weld		•	•	•	•	•	•	•				107

Pressure Ratings—All 2500 psi except flanged seals are per ASME B 16.5, temperature limit determined by diaphragm, bottom housing and/or filling fluid.

Table B – Diaphragm Material

Material	Code
316L stainless steel	S
304L stainless steel	C
Monel 400	P
Nickel	N
Carpenter 20	D
Tantalum	U
Hastelloy B	G
Hastelloy C 22 ⁽³⁾	J
Hastelloy C 276 ⁽³⁾	H
Halar Coated Monel	R
Gold Plated 304 SS	W

Table C – Housing Materials

Bottom	Code
Steel	B
304L SS	C
316L SS	S
Hastelloy B	G
Hastelloy C 22 ⁽³⁾	J
Hastelloy C 276 ⁽³⁾	H
Carpenter 20	D
Monel “400”	M
Inconel “600”	W
Nickel	N
PVC ⁽⁴⁾⁽⁹⁾	V
Tantalum clad SS ⁽⁵⁾	SU
Halar coated SS ⁽⁶⁾	BH
Teflon flanged steel ⁽⁷⁾	T
Kynar ⁽⁸⁾⁽⁹⁾	KY
Titanium	TI

Table D – Instrument Connection

Size – NPT	Code
¼	02T
½	04T

Table E – Filling Fluid

Filling	Service	Connection to Instrument	Temperature Range °F	Code
Glycerin	Pressure	Direct Only	0/400	CG
Silicone	Pressure/Vacuum	Direct or Flexible Line	–40/500	CK, DJ
Halocarbon	Pressure/Vacuum in presence of strong oxidizing agent	Direct or Flexible Line	–70/300	CF
Syltherm	Pressure/Vacuum	Direct or Flexible Line	–40/750	HA

Notes:

- (1) 150, 300, 600, 900, 1500 & 2500 class flanges.
- (2) 1" 150 thru 8" 300 class flanges only.
- (3) Use on applications where NACE standard MR-01-75/ISO 1516 w/Sept. 2005 corrigendums.
- (4) Maximum Press./Temp.
Threaded: 200 psi/74°F, 125 psi/125°F, 80 psi/150°F.
Flanged: 75 psi/100°F.
- (5) Type 102 only.

- (6) Type 102 only – Temp. Limits: –40/300°F.
- (7) Only available in 1", 1½", & 2" 150 class, Types 102.
Max. Press./Temp. – 270 psi and 150°F. Consult factory for conditions beyond these limits.
- (8) Maximum Pressure/Temp.: 200 psi and 180°F.
- (9) Type 100: ¼ or ½ NPT only. Larger sizes offered with solvent weld joint. N/A in 101 or 103 design.

Monel is a registered trademark of Huntington Alloys, Inc.
Hastelloy is a registered trademark of Cabot Corp.
Halocarbon is a registered trademark of Halocarbon Products
GYLON 3510 is a registered trademark of Garlock Inc.

HOW TO ORDER:

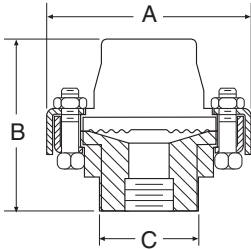
- From Table A...select TYPE NUMBER based on process connection, process connection size and diaphragm type/construction. (e.g., Threaded/1"/capsule-code-10-100)
 - From Table B...select DIAPHRAGM MATERIAL. (e.g., 316L stainless steel-code S)
 - From Table C...select BOTTOM HOUSING MATERIAL. (e.g., 316 stainless steel-code S)
 - From Table D...select INSTRUMENT CONNECTION size. (e.g., ¼ NPT-code 02T)
 - From Table E...select FILLING FLUID, if diaphragm seal will be attached to instrument. (e.g., Glycerin-code CG)
- Typical code: 10-100SS-02T-CG

Type 100 Series Threaded Capsule Diaphragm Seal

DIMENSIONS

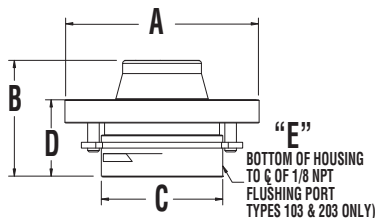
Type 100 – Threaded

¼, ½, ¾, 1 NPT



A		B		C	
in	mm	in	mm	in	mm
¾	(95)	2 7/8	(73)	1 13/16	(46)

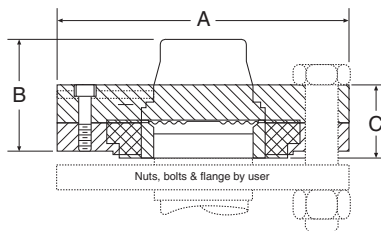
Type 102 – Flanged 1" (raised face only)
 one piece bottom housing, with and without
 flushing connection



Flange Size	Rating #	in.	A mm	in.	B mm	in.	C mm
1	150 300 or 600	4-1/4 5	(100) (127)	2-9/16	(65)	1-23/32	(69)

Flange		D		E	
Size	Rating #	in.	mm	in.	mm
1	150 300 or 600	1-5/8	(41)	3/8	(9)

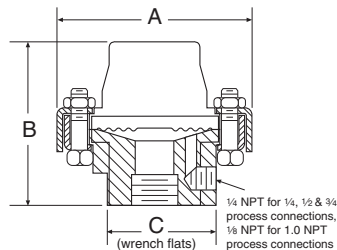
Type 102 – Flanged 1" (raised face only)
 two piece bottom housing, 1½, 2, - PVC, Teflon
 and Kynar



Flange Size	Rating #	in	A mm	in	B mm	in	C mm
1½"	150	5	(127)	2 5/8	(59)	1 13/32	(39)
2"	150	6	(152)	2 5/8	(54)	1 9/16	(40)

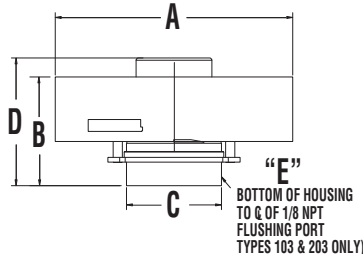
Type 101 – Threaded

¼, ½, ¾, 1 NPT (with flushing connection)



A		B		C	
in	mm	in	mm	in	mm
¾	(95)	2 7/8	(73)	1 13/16	(46)

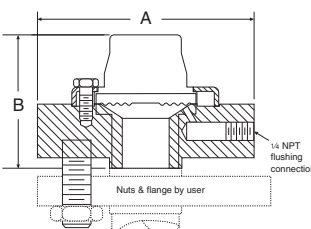
Type 102 – Flanged 1" (raised face only)
 one piece bottom housing, with and without
 flushing connection



Flange Size	Rating #	in.	A mm	in.	B mm	in.	C mm
1	900 or 1500 2500	5-7/8 6-1/4	(149) (159)	2-7/8	(73)	2-1/4	(57)

Flange		D		E	
Size	Rating #	in.	mm	in.	mm
1	900 or 1500 2500	3-3/8	(86)	3/8	(9)

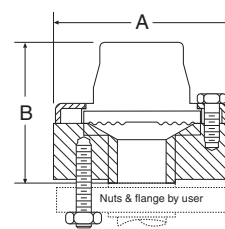
Type 103 – Flanged
 ½, ¾" (with flushing connection)



Flange Size	Rating #	in	A mm	in	B mm
150		3 1/2	(89)	2 15/16	(75)
½"	300 or 600	3 3/4	(95)	3	(76)
900 or 1500		4 3/4	(121)	3 3/8	(81)
150		3 7/8	(98)	2 13/16	(71)
¾"	300 or 600	4 1/2	(117)	3	(76)

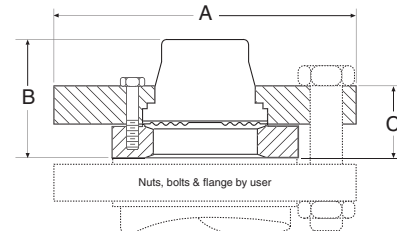
Type 102 – Flanged

½, ¾"



Flange Size	Rating #	in	A mm	in	B mm
150		3 1/2	(89)	2 15/16	(75)
½"	300 or 600	3 3/4	(95)	3	(76)
900 or 1500		4 3/4	(121)	3 3/8	(81)
150		3 7/8	(98)	2 13/16	(71)
¾"	300 or 600	4 1/2	(117)	3	(76)
900 or 1500		5 1/2	(130)	3 3/8	(81)

Type 102 – Flanged (raised face only)
 1½, 2, 3" one piece bottom housing -
 all materials except PVC, Teflon and Kynar

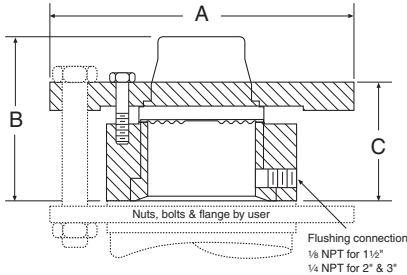


Flange Size	Rating #	in	A mm	in	B mm	in	C mm
150		5	(127)			1 1/2	(38)
1½"	300 or 600	6 1/4	(159)	2 3/8	(61)	1 1/2	(38)
900 or 1500		7	(178)			1 1/2	(38)
150		6	(152)			1 3/8	(35)
2"	300 or 600	6 1/2	(165)	1 15/16	(49)	1 1/2	(38)
900 or 1500		8 1/2	(216)			2 1/8	(54)
150		7 1/2	(191)	2	(51)	1 5/8	(41)
3"	300 or 600	8 1/4	(206)	2 1/8	(52)	1 7/8	(47)
900 or 1500		10 1/2	(267)	2 11/16	(68)	3 1/4	(82)

Type 100 Series Threaded Capsule Diaphragm Seal

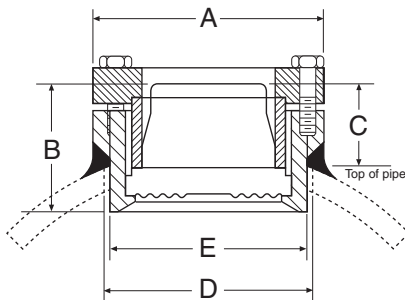
DIMENSIONS

Type 103 – Flanged 1½", 2", 3" (raised face only)
 one piece bottom housing with flushing connection



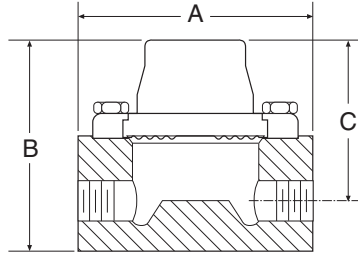
Flange Size	Rating #	A in mm	B in mm	C in mm
150		5 (127)		
1½"	300 or 600	6¼ (159)	3 (76)	2½ (64)
	900 or 1500	7 (178)		
2"	300 or 600	6 (152)	3½ (89)	2¾ (71)
	900 or 1500	8½ (215)		
3"	150	7½ (191)	3¾ (95)	2⅞ (73)
	300 or 600	8¼ (210)	3⅞ (98)	2⅞ (73)
	900	9½ (241)		
	1500	10½ (267)	3⅞ (98)	2¾ (70)

Type 105 – Saddle
 4" Pipe only



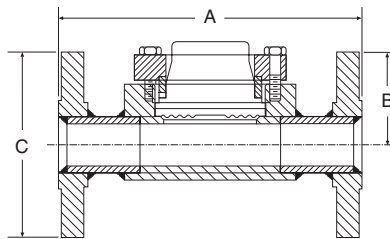
A in mm	B in mm	C in mm	D in mm	E in mm
3½ (89)	1½ (38)	1¾ (41)	3 (76)	2¾ (70)

Type 104 – In-Line Threaded
 ¼, ½, ¾, 1 NPT



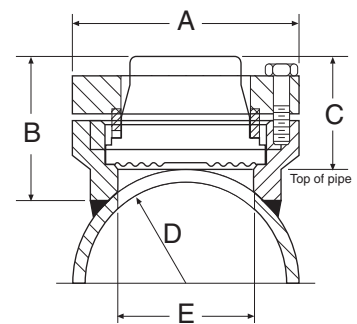
Process Connection	A in mm	B in mm	C in mm
¼ NPT		2½ (64)	2½ (64)
½ NPT	4 (102)	3¾ (95)	2¾ (71)
¾ NPT		3¾ (95)	3 (76)
1 NPT		3¾ (95)	3 (76)

Type 106 – In-Line Flanged
 ½", 1", 1½", 2", 3"



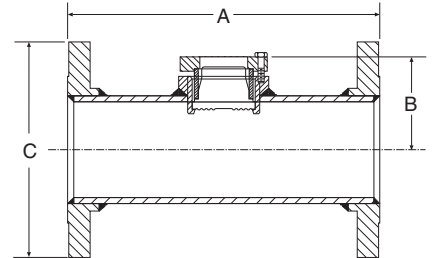
Flange Size	Rating #	A in mm	B in mm	C in mm
150	7 (178)		2⅞ (73)	3½ (89)
300	7 (178)		3¾ (95)	3¾ (95)
1"	150	7 (178)	2⅞ (73)	4¼ (108)
	300	8 (203)	4¾ (120)	4¾ (120)
1½"	150	8 (203)	2⅞ (73)	5 (127)
	300	9 (229)	2⅞ (73)	6 (152)
2"	150	9 (229)	2⅞ (73)	6 (152)
	300	10 (254)	3¾ (95)	6½ (165)
3"	150	11 (279)	3¾ (95)	7½ (191)
	300	12 (305)	3¾ (95)	8¼ (210)

Type 105 – Saddle
 3" Pipe only



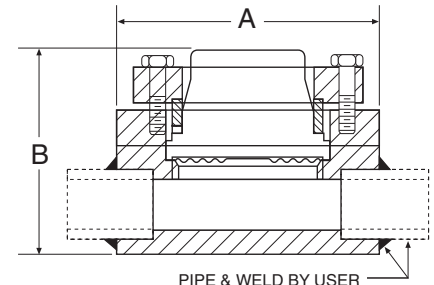
A in mm	B in mm	C in mm	D in mm	E in mm
3½ (89)	2¼ (57)	1⅞ (48)	1¾ (44)	2½ (64)

Type 106 – In-Line Flanged
 4", 6", 8"



Flange Size	Rating #	A in mm	B in mm	C in mm
150	13 (330)		3¾ (95)	9 (229)
300	14 (356)		4 (102)	10 (254)
150	16 (406)		4⅞ (124)	11 (279)
300	17 (432)		5 (127)	12½ (318)
8"	150	16 (406)	5⅞ (148)	13½ (343)

Type 107 – In-Line Welded
 ¼", ½", ¾", 1", 1½", 2"



Pipe Size	A in mm	B in mm
¼"		2⅞ (73)
½"		2⅞ (73)
¾"		2⅞ (73)
1"	4 (102)	2⅞ (73)
1½"		2⅞ (73)
2"		2⅞ (73)



CS-451-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
FLYGT	IESWLE201155	LSHH4-011	N/A	HIGH HIGH LEVEL SWITCH	LEVEL SWITCH/MANUFACTURER:FLYG T// MODEL: ENM-10 (6m)	N/A	N/A	SLUDGE TANK		rev1

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ENM-10 Level regulator

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PRODUCT DESCRIPTION

Product description

The simplest possible method for level control! A mechanical switch in a plastic casing, freely suspended at the desired height from its own cable. When the liquid level reaches the regulator, the casing will tilt and the mechanical switch will close or break the circuit, thereby starting or stopping a pump or actuating an alarm device. No wear, no maintenance! In sewage pumping stations, for ground water and drainage pumping – in fact, for most level control applications – the ENM-10 is the ideal solution.

The regulator casing is made of polypropylene and the cable is sheathed with a special PVC or Nitrile/PVC rubber compound. The plastic components are welded and screwed together. Adhesive is never used. Impurities and deposits will not adhere to the smooth casing.

This level regulator is available in different versions, depending upon the medium in which it is to be used. As standard, the regulator can be obtained with 6, 13, 20, 30 or 50 metres (20, 42, 65, 100 or 167 feet) of cable for liquids with specific density between 0.95 and 1.10 g/cm³; for other specific densities and for the Ex-version, the regulator is only available with 20 metres (65 ft) of cable. The regulator can withstand up to 60°C (140°F).

Technical data

Liquid temperature:	min. 0°C (32°F) max. 60°C (140°F)
Liquid density:	min. 0.65 g/cm ³ max. 1.5 g/cm ³
Degree of protection:	IP68, 20 m (65 ft)
Interrupting capacity of micro switch:	AC, resistive load, 250V 10A AC, inductive load, 250V 3A cos ϕ = 0.5 DC, 30V 5A
With gold plated micro switch:	same as above, except: DC, 24V 10mA

Note that local regulations may limit the voltage.

Materials

Body:	Body:
Bending relief:	EPDM rubber
Cable:	special compound PVC or NBR/PVC nitrile/PVC rubber

Dimensions

Table 1

For density g/cm ³	Regulator length mm (in.)	Diameter mm (in.)
0.65–0.80	194 (7 10/16)	100 (4)
0.80–0.95	177 (7)	100 (4)
0.95–1.10	162 (6 3/8)	100 (4)
1.05–1.20	142 (5 9/16)	100 (4)
1.20–1.30	133 (5 1/4)	100 (4)