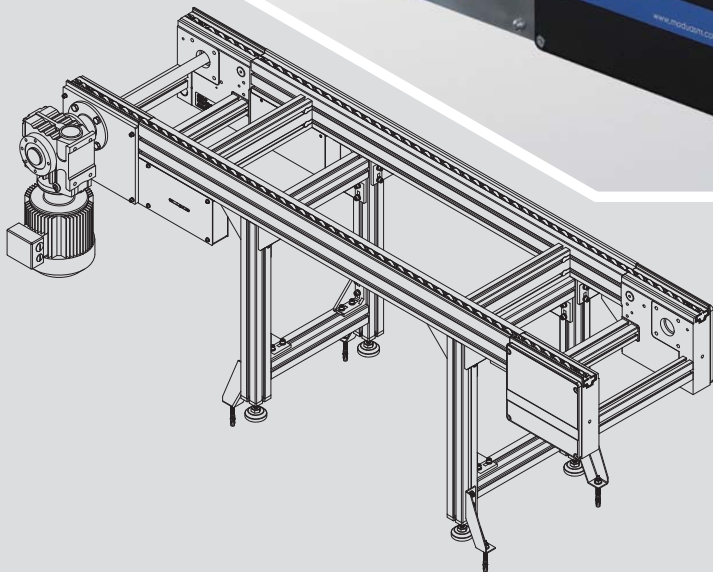


PTS4 Pallet Conveyors

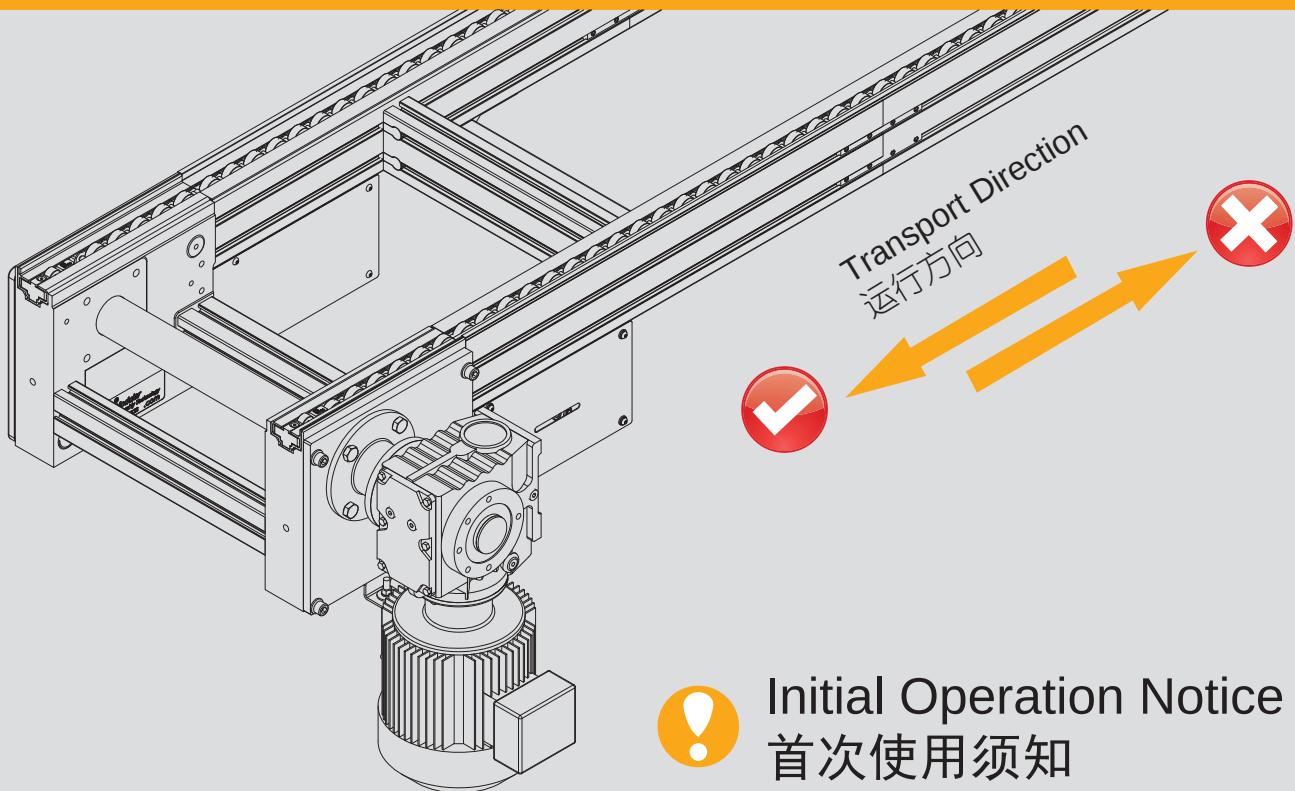
Instruction & Maintenance Manual

PTS4 托盘输送线安装使用维护手册



First time user must read this instruction
首次使用必须详细阅读使用须知

大连美德乐工业组装技术有限公司
Modular Assembly Technology Co., Ltd.



Initial Operation Notice 首次使用须知

The chain shall be fully lubricated before first use. See Page 8 for detailed operation instructions.

首次使用前，必须对链条整体进行润滑，具体操作详见第 8 页。

Overload circuit breaker must be installed (it will be provided by customers), to avoid the motor damage by overcurrent.

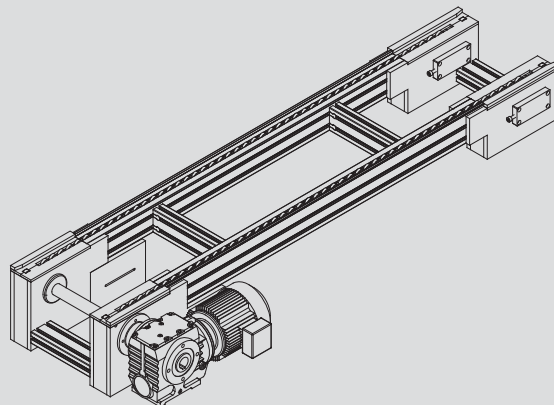
电机必须额外安装过载断路器（客户自备），可避免电流过载导致电机损坏。

Reverse direction operation of PTS4 is not permissible, which might be damaged and cannot be fixed. First operation should be controlled within 2 seconds, please check if the conveying direction of chain is right.

(The frame structure of PTS4 operating in both directions is as below.)

本手册所示 PTS4 输送机禁止反向运转，否则会对设备造成不可逆的损坏，首次运行需短促启动系统（最长 2 秒），检查链条运行方向是否正确。

（可正反转的 PTS4 输送机，外形简图如下图所示）。

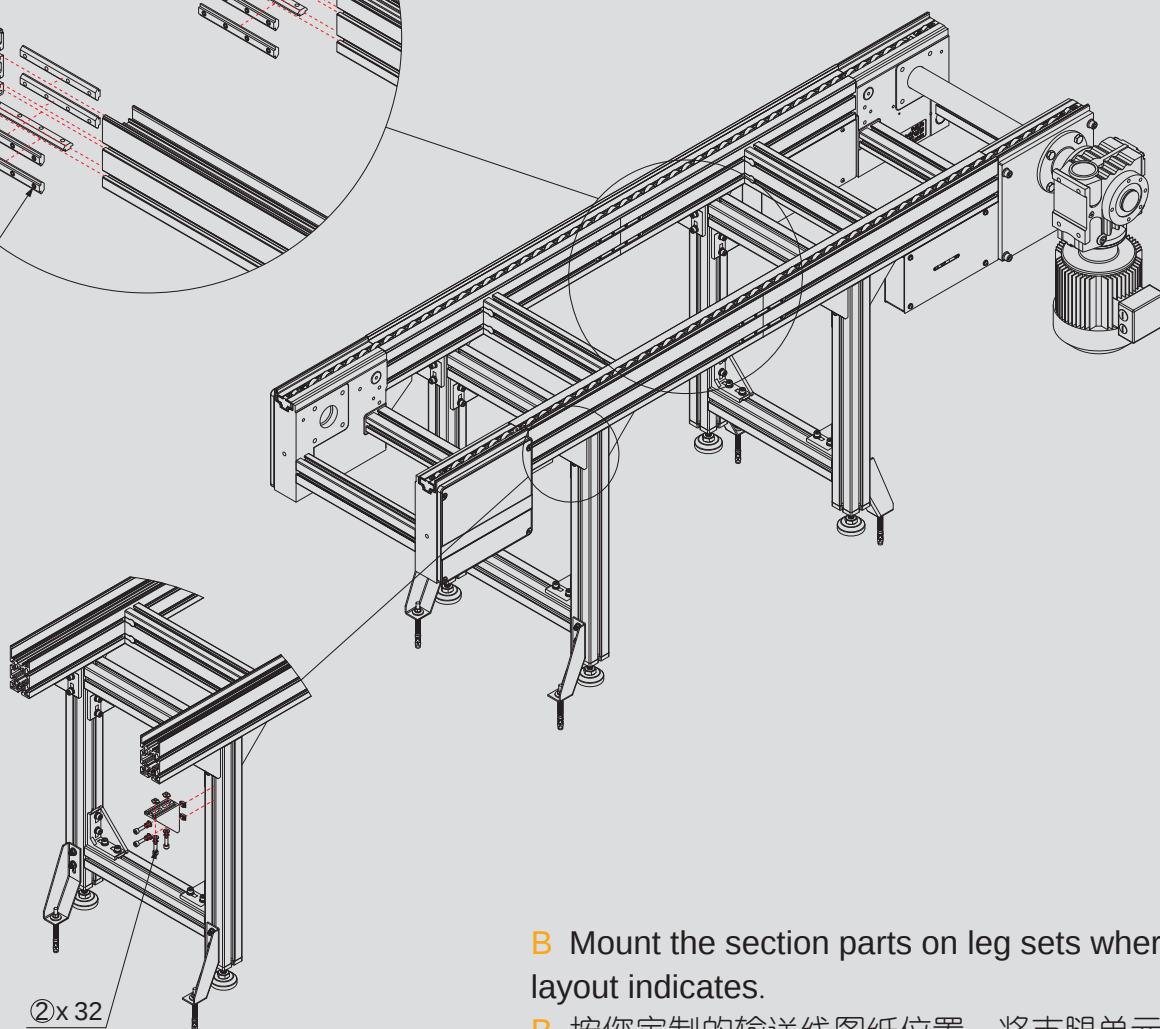
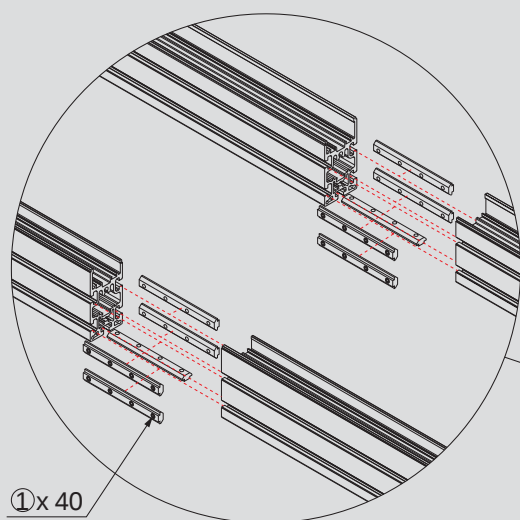


If the product is received in parts, please follow the below assembly instruction.

如果您收到的是产品单元或部件，请按照以下说明进行安装。

A Join the section parts together according to the drawing if the conveyor is made of two or more sections parts.

A 如果您的输送机线体单元由两部分或多部分组成，需按本图将线体组装为一体。



B Mount the section parts on leg sets where the layout indicates.

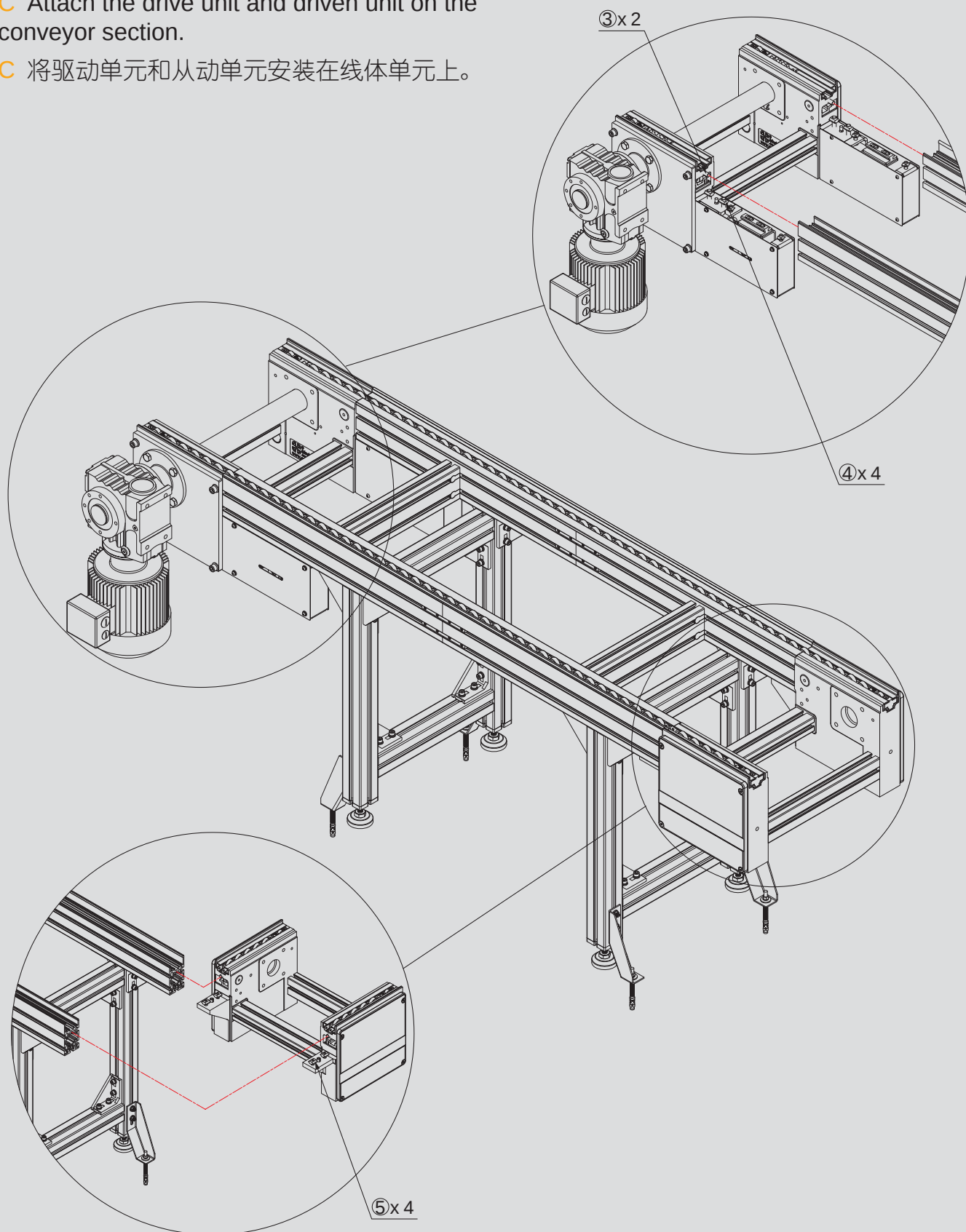
B 按您定制的输送线图纸位置，将支腿单元与线体单元组装在一起。

① M8X10
④ 6 Nm

② M8X25
⑥ 13 Nm

③ Attach the drive unit and driven unit on the conveyor section.

③ 将驱动单元和从动单元安装在线体单元上。



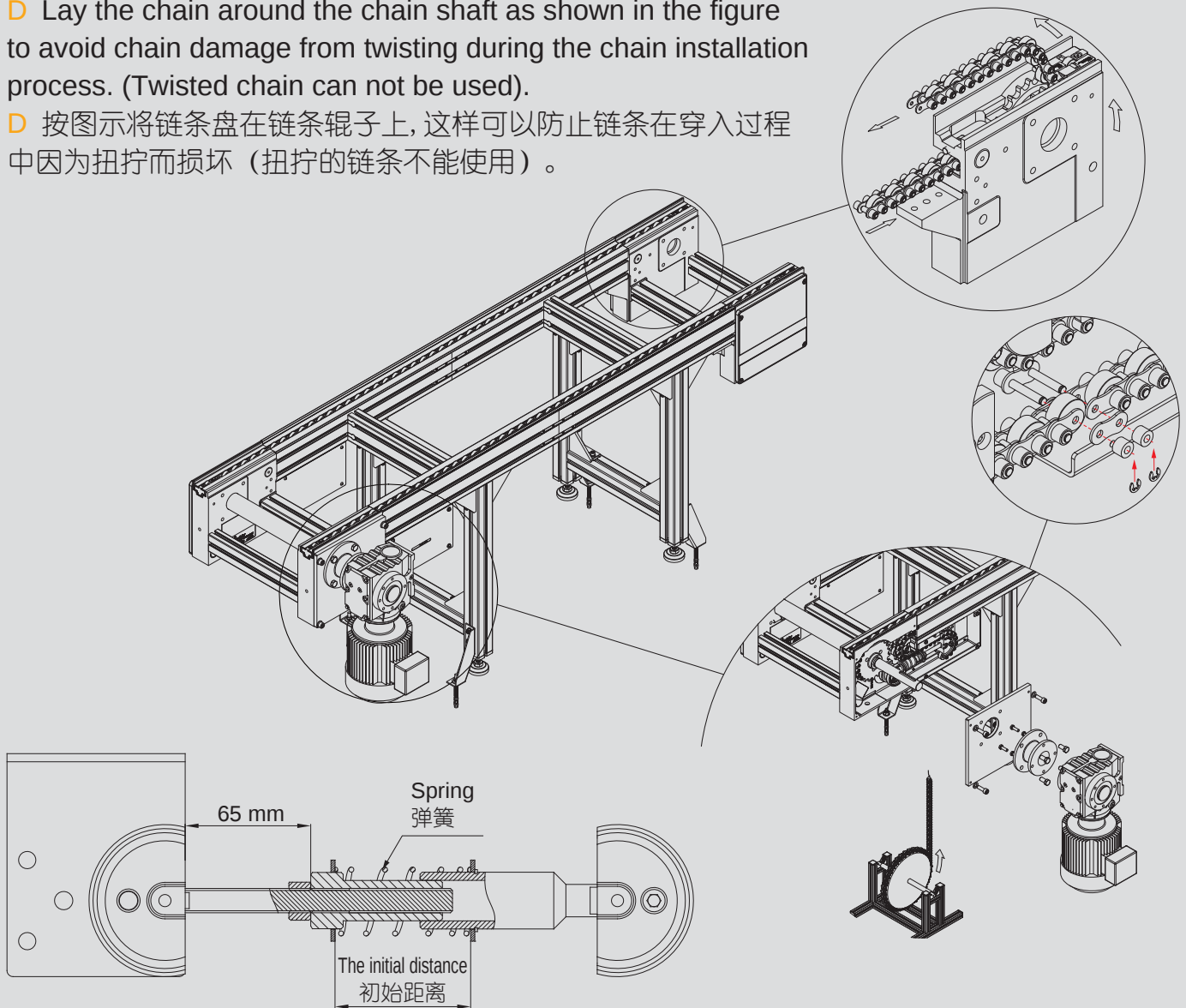
③ { M8X40
⑥ 13 Nm

④ { M8X25
⑥ 13 Nm

⑤ { M8X25
⑥ 13 Nm

D Lay the chain around the chain shaft as shown in the figure to avoid chain damage from twisting during the chain installation process. (Twisted chain can not be used).

D 按图示将链条盘在链条辊子上, 这样可以防止链条在穿入过程中因为扭拧而损坏 (扭拧的链条不能使用)。

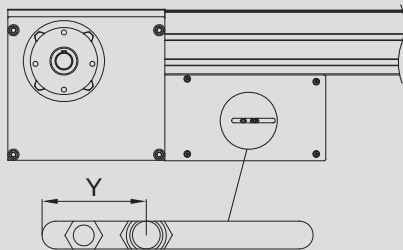


Reference value of spring installation of PTS 4 tensioning unit / PTS 4涨紧机构弹簧安装参数表										
Conveyor length 线体长度	≤ 3 m	3 m < L ≤ 4 m	4 m < L ≤ 5 m	5 m < L ≤ 6 m	6 m < L ≤ 7 m	7 m < L ≤ 8 m	8 m < L ≤ 9 m	9 m < L ≤ 10 m	10 m < L ≤ 11 m	11 m < L ≤ 12 m
The initial distance 初始距离	106 mm	104 mm	102 mm	100 mm	98 mm	96 mm	94 mm	92 mm	90 mm	88 mm

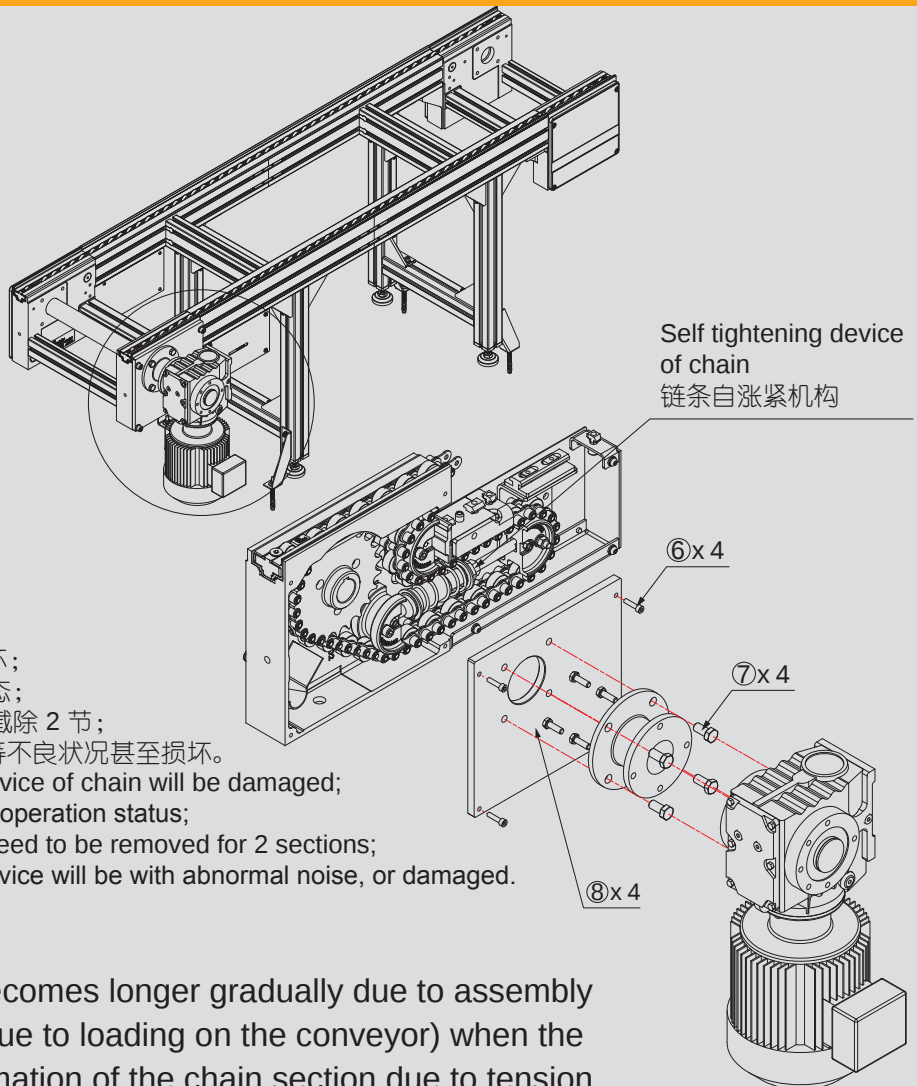
E Guide one end of chain with steel wire (Φ 2 mm recommended) going into lower part of drive unit, through lower surface of conveyor, and encircling the driven sprocket and drive sprocket. Then connect the ends of the chain with chain slipknot. (If the chain installation is operated by customer, please press the spring to the dimension as shown when connecting the chain.)

E 将链条的一端用钢丝 (建议 2 mm 直径) 牵引从驱动单元下方穿入, 由线体下层穿过, 绕过从动单元的从动链轮, 由上层向驱动端牵引, 绕过驱动端驱动链轮, 将链条用活连接在一起 (若您需要自行安装链条, 请在对接链条时根据输送线体的总长度, 将上图中弹簧的初始距离压缩到图表数值。)

Below is the view from conveyor lateral motor (in the right drawing)
下方为右图线体外侧电机端视角



Y < 30 mm时，链条自涨紧机构会被损坏；
30 mm ≤ Y ≤ 55 mm时，为正常使用状态；
55 mm < Y < 65 mm时，链条过长需要截除 2 节；
Y ≥ 65 mm时，自涨紧机构会产生异响等不良状况甚至损坏。
When Y < 30 mm, the self tightening device of chain will be damaged;
When 30 mm ≤ Y ≤ 55 mm, it is normal operation status;
When 55 mm < Y < 65 mm, the chain need to be removed for 2 sections;
When Y ≥ 65 mm, the self tightening device will be with abnormal noise, or damaged.



F It is normal that the chain becomes longer gradually due to assembly process, continuous tension (due to loading on the conveyor) when the conveyor is running and deformation of the chain section due to tension.

In order to avoid influence on PTS4 load capacity and reduce the failure potentially caused by longer chain, the conveyor is equipped with self tightening device to adjust the loose chain. As indicated, Y ≥ 30mm when delivery. When Y < 30 mm or Y > 55 mm, the conveyor shall stop for maintenance to avoid irreversible damage to the conveyor. During the seasonly check, if Y > 55 mm, that means the chain is loose and shall be removed for at least two sections to reduce the length.

F 由于受链条出厂时装配、运行过程中持续受力及链节自身受力变形的影响，链条长度将缓慢增加，这是正常现象。为避免链条增长影响整机的承载能力，减少可能由此原因引发的故障，本机配有链条自动张紧机构。如图所示，出厂时，观察口处 Y 位置应满足 Y ≥ 30 mm，如果 Y < 30 mm 或 Y > 55 mm 时，都需要进行停机维护，以免对设备造成不可逆转的损伤。在每季度的例行维护检查中，若发现 Y > 55 mm 时，说明链条过度松弛，需要通过截除链节的方式缩短链条长度，单次最少截除 2 节链节。

! Note: When Y < 30 mm, the conveyor shall stop for maintenance, or the conveyor shall be damaged.

注意：Y < 30mm 时，必须停机检修！否则输送机将被严重损坏！

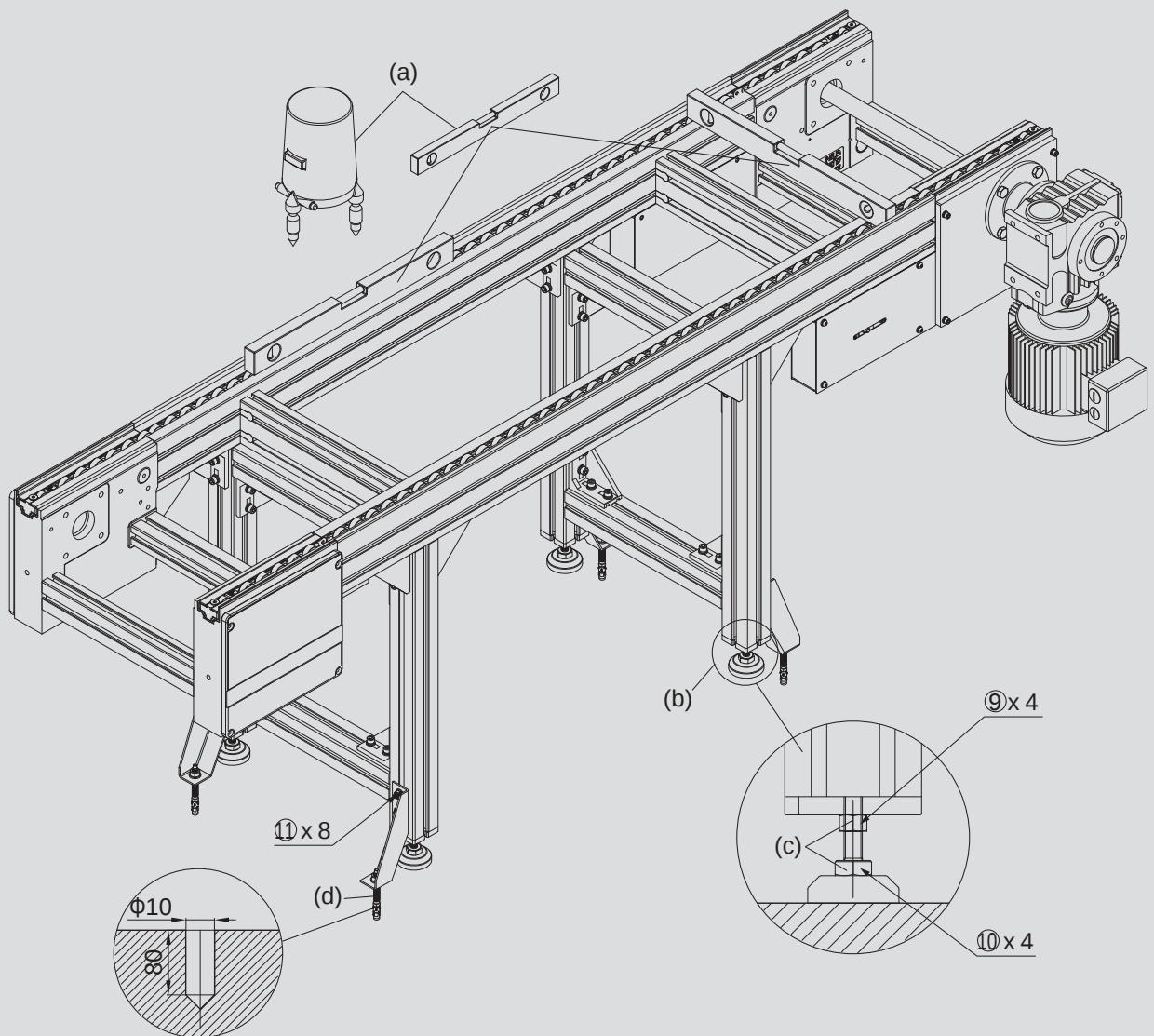
⑥ M6X30
⑤ 8 Nm

⑦ M12X25
SW18 48 Nm

⑧ M8X25
SW13 13 Nm

G With help of (a) level instruments, level the conveyor longitudinally and laterally by adjusting (b) pivot leveling feet under the stand supports. Fasten (c) nuts on the feet after adjustment. Fix the conveyor on the ground with (d) expansion bolts.

G 用 (a) 水平尺或水平仪（建议使用精度较高的水平仪）对输送线的横向和纵向进行水平调整。调节支腿下方的 (b) 微调支脚来达到要求。调整完成后，将支脚上的 (c) 螺母锁紧。最后，用 (d) 膨胀螺栓将输送线固定在地面上。



Note: 1.1. Longitudinal tolerance should be within 2 mm (Per 5000 mm conveyor).

1.2. Transversal tolerance should be:

within 0.4mm ($B_{WT} \leq 500$ mm), within 0.6 mm ($B_{WT} > 500$ mm).

注意：1.1. 纵向水平误差：每 5000 mm 线体，应不超过 2 mm。

1.2. 横向水平误差：当 $B_{WT} \leq 500$ mm，应不超过 0.4 mm；

当 $B_{WT} > 500$ mm，应不超过 0.6 mm。

⑨ M12
SW18 20 Nm

⑩ M12
SW24 20 Nm

⑪ M8
SW13 13 Nm

Maintenance

维护和保养

Modular Pallet conveyors are designed and produced for a long life cycle, but correct maintenances are required timely. These include the cleaning, replacement of damaged parts and preventive measures. The measures should be scheduled daily, weekly, monthly and quarterly.

Modular 托盘输送设备按较长的使用年限设计并生产，然而它也需要被适时和正确的维护。包括按时清洁和及时更换损坏的零部件。并做预防性的维护工作，包括下文的日维护，周维护，月维护和季度维护。

Daily Maintenance

日维护

Before running the conveyor each day, please check and remove small parts or fragments in the chain which may damage the conveyor.

每日开机前，检查和移除任何掉落于运动链条上的碎片，碎片进入到链条与轨道的间隙中会造成设备损坏。

Weekly Maintenance

周维护

Clean the dust on the surface each week.

每周清洁设备表面污垢。

⚠ Note: cleanser that might corrode metal can not be used.

注意：不能使用能够腐蚀金属的清洁剂。

Monthly Maintenance

月维护

Check the fasteners that may loose and tighten them with wrench each month. Check whether the chain need to be lubricated, if yes, see the Chain Lubrication instructions page 8 for operation to ensure long service life (Except for maintenance free chain).

每月检查可能松弛的紧固件，并使用对应的扳手上紧；检查链条是否需要润滑，如需润滑请参照第 8 页《链条维护》说明进行操作，以保证较长的使用寿命（免维护链条除外）。

⚠ Note: lubricant that might corrode UHMWPE, POM, Nylon or rubber etc can not be used.

注意：不能使用可能腐蚀超高分子量聚乙烯，POM，尼龙，橡胶等材料的润滑脂。

Seasonally Maintenance

季度维护

Check if the chain is loose seasonally. If necessary, the chain length need to be shortened by removing chain knots. (Refer to step F in installation instruction)

每季度检查，重点观察输送链条是否松弛。如果有必要，通过截除链节的方法来缩短链条长度。
(说明参照安装步骤F)

Chain Lubrication

链条维护

Lubrication of Chain In Carbon Steel

碳钢链条润滑

The chain shall be lubricated before starting the equipment. Lubrication method: the whole chain need to be lubricated. It is suggested to use Shell 15W40 machine oil. 2~3 ml of oil per meter. See figure 1 for lubrication point.

The equipment shall be re-lubricated after stop for more than 6 months. The redundant lubricating grease, oil or other impurities need to be cleaned before lubrication. Check whether there is worn or extended chain during lubrication process. The lubrication method and oil volume are same as first use. It is suggested to re-lubricate the chain if no exact stop duration is known.

When the equipment is in normal use, the chain shall be lubricated each 1000 hours. Little lubrication oil each time is suggested. It is about 2 ml lubrication oil per meter (maintenance free chain excluded). When the equipment is in humid environment, it is necessary to shorten the lubrication cycle according to the situation.

It is suggested to use AL automatic lubrication system. It will provide the even lubrication on the chain during the running process. See figure 2 for lubrication point.

首次开机前，链条必须润滑，润滑方式：转过全部链条，用大约 2 ~ 3 ml/每米的油量（推荐使用15W40壳牌机油）给链条上油，润滑点如图 1 所示。

设备停机 6 个月或更长时间后，需要重新润滑，润滑前需清除链条上多余的润滑脂、油污或者其他杂质；在进行润滑时，需要检查输送机链条是否磨损和伸长；润滑方式及所需油量与首次开机相同。

如果不清楚设备停用了多久，建议重新开机前做好润滑。

设备正常使用时，链条每 1000 小时需要润滑一次，每次少量润滑，每米链条使用约 2 ml 润滑油（免维护链条除外）。设备运行环境湿度较大时，需要根据实际情况缩短润滑周期。

我们推荐使用 AL 自动润滑系统，它能够在设备运行过程中对链条进行最佳定量的均匀润滑，润滑点如图 2 所示。

Fig.1 图1

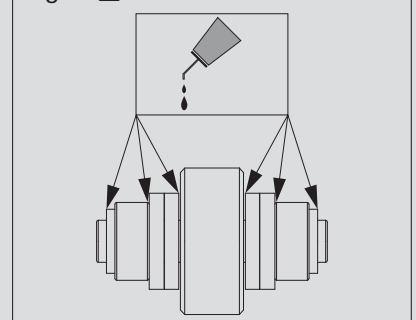
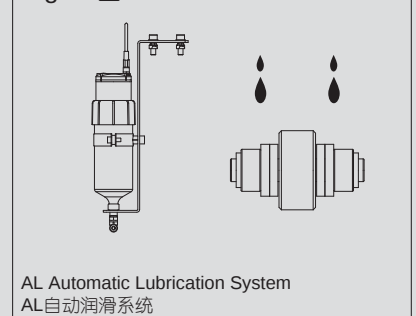


Fig.2 图2

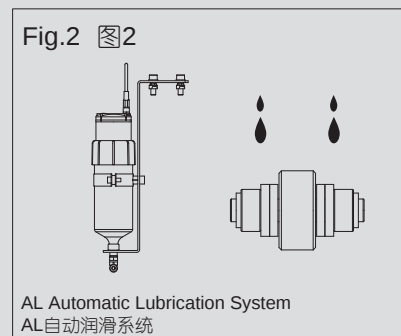


Automatic Lubrication

自动润滑

AL automatic lubrication system will provide the even lubrication on the chain during the running process, the lubrication oil per meter is 0.85 ml/100 h min ($\approx 8 \text{ g}/1000 \text{ h}$). Refer to Figure 2 for lubrication point.

AL自动润滑系统能够在设备运行过程中对链条进行最佳定量的均匀润滑，每米线体润滑供给量 $\geq 0.85 \text{ ml}/100 \text{ h}$ ($\approx 8 \text{ g}/1000 \text{ h}$)，润滑点如图 2 所示。



The setting of Automatic Lubrication Circle

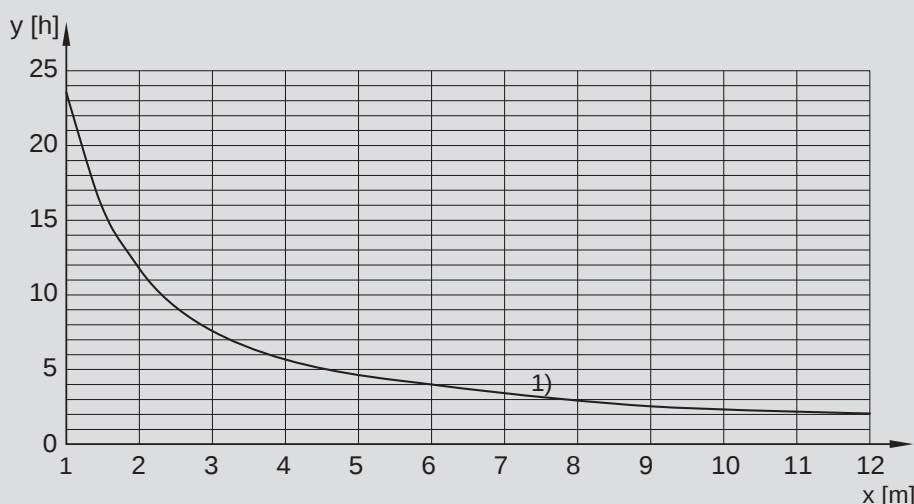
自动润滑周期设置

Reference value of lubricating circle for 120 ml oil tank (month) / 120 ml油罐润滑周期参考值 (月)												
Conveyor length/输送线体长度	1 m	2 m	3 m	4m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m
Carbon steel chain/碳钢链条	12	9	6	5	4	3	3	2	2	2	1	1

Reference value of lubricating circle of 250 ml oil tank (month) / 250 ml油罐润滑周期参考值 (月)												
Conveyor length/输送线体长度	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m
Carbon steel chain/碳钢链条	12	12	12	10	8	6	5	5	4	4	3	3

The Setting of Automatic Lubrication Pulse

自动润滑脉冲设置



x [m]: Conveyor length
输送线体长度

y [h]: The interval of pulse lubrication
脉冲润滑的间隔

1): Reference value /Impulse for chain in carbon steel: 0.26 ml
碳钢链条每脉冲的剂量: 0.26 ml

Note: 1. The length difference of lubrication lines is 10 mm max. Different length of lubrication lines may lead to unequal distribution of lubrication oil because of uneven flow resistance.

注意: 1. 润滑管道的长度差别要 $< 10 \text{ mm}$ 。不同的润滑管道长度由于不同的流动阻力可能会导致润滑剂分配不一致。

⚠ Note: 2. The lubrication line must always be located lower than the lubrication pin, otherwise the lubrication line runs dry (uncontrolled oil leakage, air bubbles form in the tubing).

3. Please fill in the lubrication lines with oil before the first operation. For example, Actuate the lubrication system by pressing button in the PLC control until the oil is spilled out of the line. (the details please refer to the mannual of AL lubrication system).

注意： 2. 润滑管道必须处在润滑头的下方，否则润滑油会不受控流出，在润滑管道形成气泡，甚至可能导致润滑管道流空。

3. 在初次运行前请注满润滑管道，例如，操作润滑设备 PLC 控制器上的键 (详见自动润滑单元使用手册)，直到润滑剂从润滑头中溢出为止。

Regular Troubleshooting

常见故障及处理方法

1. Abnormal noise from chain: it is mostly because of minor parts falling into the chain. If any, stop the equipment at the first place and take out the parts according to the noise.
 2. Noise from drive unit or driven unit: the bearing maybe need to be lubricated.
 3. Overheated motor: check if the equipment is overloaded, there is loose motor wire or the motor loses on phase.
1. 链条异响: 多由微小零部件掉入链条间隙引起，需要紧急停机，根据声音位置找到异物并取出。
 2. 驱动单元或从动单元异响: 考虑是否轴承需要润滑。
 3. 电机过热: 检查设备是否超载，电机接线是否松动或电源是否缺相。

Modular Conveyor System

模块化输送系统

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