

SON Schmidts Original Nabendynamo

Installation Instructions 26"-28"

Schmidts Original hub dynamo marked 26"-28" (SON 28) is designed for a front wheel measuring 646 to 716 mm overall. It should not be used in smaller wheels, because no-load voltage will reach dangerous levels at higher speed.

In terms of function, reliability and design, the Schmidt LED headlights Edelux and switched halogen E6 headlights are ideally suited for use with the SON 28. Other high grade headlamps with switch or automatic sensor are also suitable, e.g. the LED Lumotec headlamps by Busch & Müller. All these headlights are provided with an integrated overvoltage protection. Since year of manufacture 2007 you can recognize it by this test symbol:



Building the hub into a wheel is best left to an expert - who should nevertheless note the information below.

Wheelbuilding

The SON 28 is designed for the usual crossed form of spoking. Radial spoking is not permitted. Flange thickness and spoke holes are optimised for high quality 2 mm (14 g) spokes.

The correct length of spokes is determined with reference to the rim radius r_2 (see drawing below). This radius is half the distance measured between two opposite nipple seats. The ideal spoke length l is calculated as:

$$l = \sqrt{r_1^2 + r_2^2 + a^2 - 2 \cdot r_1 \cdot r_2 \cdot \cos \frac{k \cdot 720^\circ}{n}}$$

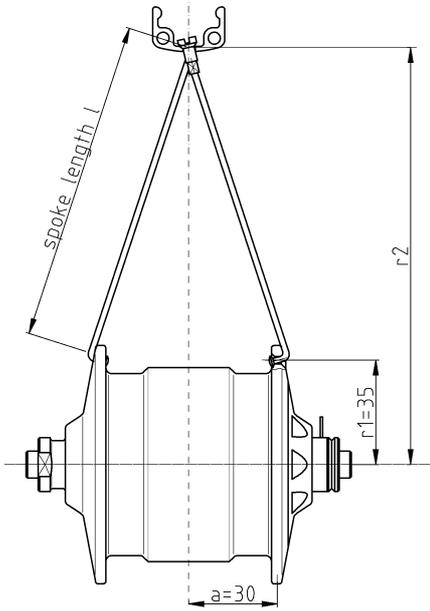
k = number of crossings
 n = total number of spokes

For usual 26" or 28" wheels this can be simplified to:

36 hole, 3 cross: $l \approx r_2 - 14,0 \text{ mm}$

32 hole, 3 cross: $l \approx r_2 - 9,5 \text{ mm}$

If in doubt, or if the result comes between available sizes, use spokes up to one millimetre shorter. The disc brake hub differs in some aspects, so please note the special info leaflet.



Fitting the front wheel

Schmidts Original hub dynamo SON 28 fits a fork designed to accept an axle of 9 mm diameter and a width of 100 mm between dropouts. **The electrical connections should be on the right hand side** (to prevent unscrewing of the hub).

The hub is secured using the included skewer set. It fits the same way as a quick-release, but fastens with a 5 mm allen key (**recommended torque moment 6 - 8 Nm**).

Apply a little grease on thread and screw-head but not on the shank (to prevent clogging up the pressure compensation system leading into the hollow axle). If the skewer tension is too low, the axle may move inside the fork end causing a rattling noise.

Alternatively a lever-type quick-release may be substituted, or a proprietary security fastener such as Pitlock.

Fitting the headlamp

The coaxial cable attached to the headlamps with integral switch (manufactured or assembled by Schmidt Maschinenbau) should be just the right length to facilitate mounting of the lamp in the usual position, on a bracket in front of the fork crown or on a front carrier. It is suggested that you fasten the cable to the fork blade etc. with nylon zip-ties, leaving enough slack by the axle to facilitate disconnection from and reconnection to the hub. Either plug may be connected to either spade terminal (they simply push together), it makes no difference which way round.

If you wish to mount the headlamp further away from the hub than this cable will permit, it is possible to order an Edelux or E6 headlamp equipped with a longer cable and separate plugs etc. This can be trimmed to the required length, after which you must attach the plugs yourself according to the process illustrated below.

 1	<ul style="list-style-type: none"> • Cut cable to length and strip carefully over a length of approx. 4 cm • Twist the ends of the outer wires
 2	<ul style="list-style-type: none"> • Strip the inner conductor about 5 mm • Heat the 32 mm piece of thin shrink tube with flame or a hot air gun to shrink it onto the outer conductor • Shrink a fat piece of shrink tube onto the junction
 3	<ul style="list-style-type: none"> • Fit the female connectors • Crimp the plugs on with a crimping tool or pointed pliers (if in doubt, solder as well). The first pair of claws must grip the insulation
 4	<ul style="list-style-type: none"> • Shrink on the fat shrink tubes • Grease the plugs a little, so you can push the contacts onto the SON hub dynamo more easily

Headlamps with integrated switch by other manufacturers are usually equipped with twin cables instead of coaxial cable. Instead of step 1 and 2 the cable only has to be cut to length, the two wires separated for about 3 cm and the insulation removed at about 5 mm.

Connection of a rear lamp

The generator should always be connected to a 6V3W load. The usual way is the combination of the 2.4W headlight and a 0.6W rear light or a special 6V3W halogen bulb. The permanent use of a 6V2.4W bulb alone will shorten the bulb lifetime radically (not valid for the E6 headlamp)!

We recommend a high-quality LED rear lamp with capacitor standlight (e.g. DToplight plus or Seculite by B&M).

The switch in the headlamp will also control the operation of the rear lamp. A single wire connection from the innermost spade terminal (on some models marked with a flash) of the headlamp to the rear lamp will usually be sufficient (the system is earthed at the mounting hole of the lamp). A 2.8x0.5 mm plug should be connected according to pictures 3 and 4 of the table above.

A definite neutral/earth connection can be made (i.e. double wiring) by using the spade terminal marked with the earth symbol (only Lumotec and Lumotec Oval Plus) or by adding a 6 mm crimp eyelet between the lamp and its bracket.

Most reliable and elegant cables are the Schmidt coaxial cables for rear lamps. The cable for rear lamp with overvoltage protection (item no. 72095) must be used in case the headlight itself is not provided with an integrated overvoltage protection.

Maintenance

The generator is fully enclosed and maintenance free: there are no gears or other moving parts inside. The wiring and lamps should be checked regularly and any defects repaired in order to avoid dangers caused by high voltage.

The ball bearing cartridges are pre-lubricated and similarly maintenance-free in normal everyday use. A slight amount of play is normal with this type of bearing - do not attempt to adjust or regrease them.

The stainless steel axle and the parts that are pushed on are threadless. They cannot and must not be twisted.

To avoid water ingress do not immerse the hub and take care when washing it never to spray water (from a hose etc.) directly at the axle.

In case of any problems (e.g. worn bearings, damaged electrical contacts) let your bike shop contact the manufacturer or importer. For warranty claims (5 years) please add a copy of the purchase receipt.

Important advice

With the lights switched off, the fast spinning generator induces a high and possibly dangerous voltage. For this reason the switch and generator must be connected by a fully insulated cable like the one provided, i.e. with no bare parts.

Manufacturer

Wilfried Schmidt Maschinenbau
www.nabendynamo.de